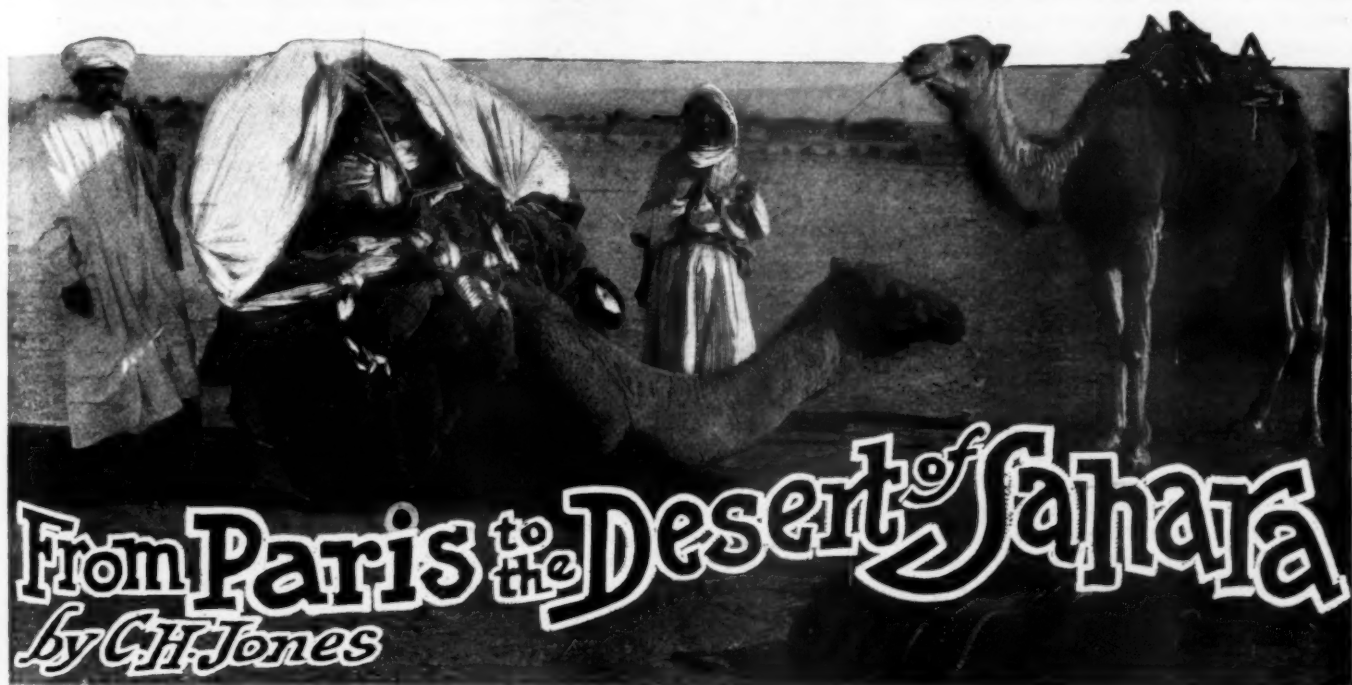


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DESIRING to learn of a country in which automobiling could be done in winter under enjoyable conditions, I made inquiries in New York and Paris at all the usual sources of information, and was told that in the French colonies of Algeria and Tunis I would find what I sought. The only information obtainable was that the roads were good, the climatic conditions favorable, and automobilists were going to Northern Africa in increasing numbers. Neither in New York nor Paris could be obtained that specific information that is so much desired by automobilists proposing to enter a new field, and it was found later that in Algiers itself such information of a trustworthy character is extremely difficult to procure.

From books very little can be learned that is of any use at all to automobilists. "Murray's Guide to Algeria and Tunis" is out of print and not obtainable; a new edition is promised for next Fall. Miss Cronnse's "Algiers" is of no practical value at all. "Cook's Practical Guide to Algeria and Tunis" contains a great deal of information that is helpful and interesting to the ordinary sightseeing tourist. "Reynolds-Ball's Mediterranean Winter Resorts" tells about all one wants to know concerning climatic and health conditions, though it is apt to mislead those who have not already acquired some definite idea as to the North African climate. And the "Guide Joanne" (in French) to Algérie et Tunisie is the best of all, because its general information as to hotels and places of interest is ample, well arranged and up-to-date (last edition 1906). Some helpful data were found in the last pages of the "Guide Routier Continental" for 1906, but the figures as to distances, etc., contained therein appear to be based on guesswork and not on exact knowledge. For automobilists the most helpful information is still to be found in an article written by Cortlandt F. Bishop.

It is to furnish readers of THE AUTOMOBILE with up-to-date and trustworthy information that this article and two others that

are to follow it are written. I wish to state with emphasis at the outset that they are not intended to be a substitute for or even a supplement to the descriptive guide books. Their sole aim is to give such definite, specific and practical facts as will enable automobilists to determine, in the first place, whether or not they care to take their cars to Algeria and Tunis; and, in the second place, to avoid those difficulties and annoyances that are likely to result from ignorance of existing conditions.

A Winter Run from Paris to the Mediterranean.

On Friday, March 8, at 5:40 P.M., we ("we" consisting of self and chauffeur) made our exit from Paris. Our purpose was to catch the Monday boat from Marseilles to Algiers, to accomplish which it was necessary to reach Marseilles Sunday night. We had estimated that, in the absence of disabling accidents and with reasonably favorable conditions, we could do this by leaving Paris not later than 2 P.M. on Friday, staying at Avallon the first night and at Lyons the second night. Although our departure was some three and a half hours later than this, we hoped, with good luck, to make the journey within the limit of time. Our car was a 24-horsepower Panhard (model 1906), with demi-limousine body and weighing in all 4,168 pounds—the pertinence of these details will become evident further on. It had been sent to the Panhard repair shops for a thorough overhauling, but it had not been "tried out" or "tuned up," and all the way down to Marseilles we were delayed at intervals by the necessity of making adjustments of the mechanism which the layman cannot help fancying should be made in the repair shop, but which for some inscrutable reasons never are.

It was partly owing to these delays that we made only half the distance to Avallon the first night, passed through Lyons on the afternoon of Sunday, and did not reach Marseilles (499 miles) until 6:30 P.M. Monday—too late for the steamer. But

it was chiefly due to the condition of the roads. Beyond doubt the roads of France are the best in the world, but after the winter's wear and before the spring repairs are made their condition is such as to render high speed impossible for long distances, especially when, as in our case, a streaming rain accentuates all the bad places. It will be well for automobilists to bear this in mind when they plan to anticipate the usual season for autoing. Another fact that may interest them is that in winter and early spring the cost of gasoline (called "essence" in France and her colonies) is from 20 to 25 per cent. higher than in summer. At Villeneuve-St. George, where most of the automobilists leaving or entering Paris by the great southern route fill up their reservoirs, and where the regular summer price of gasoline is 28 centimes per liter (about 22 cents a gallon), we had to pay 40 centimes; and at Chalons, at Macon and at Avignon, where the usual summer price is 35 centimes a liter, we had to pay 45 centimes.

On the trip from Paris to Marseilles, 225 liters of gasoline were consumed, at an average cost of 42 1-2 centimes per liter. The cost per kilometer (a kilometer is five-eighths of a mile; the term will usually be used in these articles, partly for convenience and partly because automobilists in Europe and Africa must accustom themselves to this measurement of distance, the mile being unknown) was almost exactly 12 centimes, as compared with an average of 10 centimes per kilometer in France and Germany during the summer of 1906 with the same car. The average consumption was one liter to three and a half kilometers (about a gallon to nine miles), as compared with one liter to four and a fourth kilometers (about a gallon to eleven miles) in 1906; the latter figures showing the difference in the condition of the roads, the car presumably being equally efficient on both occasions.

Shortly before noon of Wednesday, March 13, the machine having in the meantime been again thoroughly overhauled in a Marseilles repair shop, our car was hoisted by ship's winch to the deck of the steamer *Maréchal-Bugeaud* of the Compagnie Générale Transatlantique line, securely fastened and covered with a tarpaulin. At 1 P.M. the steamer sailed, and at 3:30 P.M. the next day we arrived at Algiers and the car was landed the same afternoon. The requirement of a certificate from the customs authorities caused some delay, but next morning the car was available for use, having been embarked and disembarked with no damage except a few scratches of the paint. The cost of transportation, including the embarkation fee at Marseilles and the fee at Algiers, was 192 francs 50c. (\$38.50).

First Impressions of Sunny Africa Were Chilling.

In Paris the weather was as cold as in New York, and in Marseilles it was colder than in Paris. As we approached the coast of Africa, long before Algiers itself came into view, we were surprised to see the majestic rampart of mountains a little back from the coast snow-clad a third of the way down from their summits. The effect of this was evident in Algiers when we landed, the men being overcoated and the women wearing furs, precisely as in Paris. At the hotel, wood fires hardly sufficed to take the chill off the bedrooms, and the sitting rooms and dining room were heated just as they would have been in New York. The thin clothing we had expected to don as soon as we landed was left in the trunks, and the writer's travel party, which had preceded him by steamer, was found at the hotel, shivering and disgruntled, anathematizing Algiers and its climate and counting the hours until we could leave for Biskra and the genial warmth of the desert. Of course, we were assured that the weather was "unseasonable" and that "such



STREET SCENE IN SIDI OKBA.

a winter had never been known before."

Algiers as a city has been too often described for it to be worth while to detail it again here, even if description were the purpose of these articles. It is beautifully situated, climbing from the harbor up the side of a steep hill, backed by mountains, and overlooking a lovely bay. From the high-lying suburb of Mustapha the views are entrancing, and seen in the distance from either sea or shore its white radiance dazzles in the sunshine. But anyone who goes to Algiers expecting to find an Oriental city will be disappointed. Viewed from afar or inspected close at hand, it is a distinctly French city with many European counterparts. Arabs in the streets, in white burnouses and headaddresses, add a touch of picturesqueness, and there are an Arab quarter and a few native mosques and other buildings that are worth visiting; but the dominant note is altogether European.

In the streets of Algiers one sees almost as many automobiles as in any French provincial city of similar size, but most of them are obviously for city use only. The leading hotels manage to house automobiles in some fashion; there are in the city four good garages, with two more approaching completion; three agencies for the sale of automobiles, and some four or five shops at which tires and other accessories are kept in stock. Gasoline is readily obtained, the price being uniformly 2 francs 50c. for a five-liter *bidon* (about 40 cents a gallon).

Off for the Warmth of the Sahara.

From Algiers three or four excursions may be made with comfort by automobile over good roads. Perhaps the most enjoyable of these is to Medea via Blidah. This involves a climb up to the great plateau which lies between the minor Atlas range that borders the coast and the major Atlas mountains that confront the Desert of Sahara from Morocco to Tripoli. Blidah (31 miles) is the center of an extensive orange-growing region, and Medea (60 miles) of the best wine-making district of North Africa. More interesting than either town is the Gorge of the Chiffa, which lies about nine miles beyond Blidah; and from Blidah the famous baths of Hammam R'hira, where is an extensive thermal establishment, may be visited—they are about fifty miles distant. Another excursion is to Cherchel, on the seacoast, about seventy-three miles from Algiers; over a road that during the latter part of the journey hugs closely the shore of the Mediterranean. It was the ancient Caesarea of the Romans, a capital of Mauritania, and offers to the tourist some interesting Roman ruins. One of the grand national routes leads westward from Algiers to Oran 461 kilometers (about 300 miles), but it traverses an uninteresting country and in places the road is said to be very bad.

We made none of these excursions, partly because they did not solicit us very strongly, but chiefly because of our desire to get as quickly as possible to the warmth of the Sahara. It was intimated to us at Cook's, and by the secretary of the local automobile club, that we might encounter snow in going over the mountains to Bougie, but here as elsewhere the information obtainable as to routes and conditions was very indefinite, and we had only the vaguest idea of what lay ahead of us.

We left Algiers, a party of five, at 9 A.M. on Saturday, March 16. As far as Azazga (135 kilometers) the road, bad in places but fairly good as a whole, traversed a level country without a single interesting feature except the backward view of Algiers. The cultivated fields were green with wheat from three to six inches high, and occasional almond trees showed their pink blooms. The only tree that is at all numerous is the eucalyptus, which is popular because of its quick growth and its ability to send its roots down to incredible depths in search of moisture.

At Tizi Ouzon (100 kilometers) we stopped for lunch, and the proprietor of the Hotel Lagarde confirmed our information that we should encounter snow in crossing the mountains. Here the gasoline tank must be filled, as no fuel can be obtained before reaching Bougie, 160 kilometers away by a mountainous road. The charge was 2 francs 75c. for the *bidon* of 5 liters (at the rate of 44 cents a gallon).

At Tizi Ouzon the fact was brought home to us for the first time that we were in an Oriental land. A native market was being held, the town swarmed with Arabs and Kabyles, and for ten kilometers the road was thronged with a motley crowd returning home astride of donkeys about as large as Newfoundland dogs, or driving sheep, goats and the diminutive cattle of the country. At Tamda (115 kilometers) the first camel was seen.

A Wild Ride Across Snow-clad Mountains.

At the small village of Azazga the foothills of the Atlas are reached, and a climb begins that is almost uninterrupted for 45 kilometers. At first the road winds up through the vast cork forests of Kebouch, which are a source of large revenue to the French Government, but soon all vegetation is left below and then the route ascends an apparently endless succession of bare, desolate and stony steep. It is a lonely land, bleak and forbidding of aspect, with no signs of human habitation except here and there, at infrequent intervals, a Kabyle village of stone or mud huts nestling on the precipitous declivity of a distant hill. Between Azazga and El Kseur, at the foot of the mountains on the other side, a distance of about 110 kilometers, no food or supplies, no help of any kind, could be obtained in case of accident or delay; and the road is such that it would be in the highest degree dangerous to attempt to travel any portion of it at night. For this reason it would be more prudent for automobilists, especially those with heavy cars, to leave Algiers in the afternoon, spend the night at Tizi Ouzon, and give themselves the whole day for the journey across the mountains to Bougie. This should certainly be done when the trip is made earlier than the end of March. For a distance of ten kilometers on either side of the summit, March 16, we drove through snow which lay on the road from three inches to a foot in depth; long stretches of the road were soft and spongy; there were places where the roadbed had been washed out and hastily repaired with broken stone; other places where precipices yawned on one side while steep cliffs towered on the other.

For many reasons the climb from Azazga is one to be remembered; not the least being the impressive scenery. The descent to El Kseur is less steep and over a better road, the latter part through another extensive cork forest, whose foliage resembles that of our live oaks at home. El Kseur was reached just at dusk, and then a quick run of 26 kilometers over a level road brought us to Bougie, where we arrived at 8:10 P.M. and found comfortable if not luxurious quarters at the Hotel d'Orient.

Looking out of our windows next morning the beautiful situation of Bougie was revealed to us. It lies at the head of a deep bay, in an amphitheater of enclosing mountains, directly under the Gourara. Anciently, under the Carthaginians, the Romans and the Vandals, it was a flourishing commercial seaport, and under the Barbères in the eleventh century it had 20,000 houses and over 100,000 inhabitants. When the Turks captured it in the sixteenth century decay set in, and it is now a rather dingy town of 14,000 inhabitants.

After filling the gasoline tank at a cost of 2 francs 75c. for the *bidon* of 5 liters, we left Bougie at 9:20 A.M., March 17, skirted the seashore across a level plain for 22 kilometers, and then climbed steeply

around the face of Cap Aokas, with exquisite views seaward, reminding one of the road from Sorrento to Amalfi in Italy. At kilometer post 34 the road to Sétif (which we followed) turns off directly south. The continuance of the Cap Aokas road eastward skirts the seashore amid magnificent scenery, winding along the front of steep cliffs and passing through tunnels, with the surf beating over the roadway in places, and ends at Djidjelli, the Ingilgitis of Roman times.

Turning south at kilometer post 34 we ascended a swift-flowing stream which, in its descent to the sea from the high tableland, breaks through the coast range of mountains, forming the Gorge of Chabet-el-Akra. The gorge begins about kilometer post 40 (from Bougie) and ends at kilometer post 58. For the greater part of the distance it is disappointing, but the last eight kilometers are a stupendous cliff-enclosed ravine, with a tormented torrent rushing and foaming at the bottom, and the road hewn at tremendous cost along the frowning face of overhanging precipices.

At the upper end of the gorge is the small Kabyle town of Kerrata. From this point the road ascends in long windings, by easy grades, through a desolate, treeless and sparsely inhabited country, to the summit of the coast range (3,800 feet above the sea), and then makes an almost imperceptible descent of 400 feet to Sétif, 112 kilometers from Bougie.

The road through the gorge of Chabet-el-Akra, ordinarily a good one, was in places almost impassable. Deluging rains had swept sections of it into the swollen stream, and these gaps were being repaired with broken stone shoveled in and left loose and uncovered, threatening to cut the tires at every revolution of the wheels. Near the summit of the pass we again passed through snow-fields, and on many of the hill-slopes the roadbed was so soft as to make very heavy going. At Sétif we learned—what ought to have been told us at Algiers—that there is another comparatively level road from Algiers, which, though far less attractive scenically, is at this season of the year much safer for automobilists.

Over the Plateau to El Kantara.

We arrived at Sétif at 1:40 P.M. and found fair, if somewhat frigid, accommodations at the Hotel de France. Here we were told that a road directly across the level plateau to El Kantara had recently been made practicable, and as it would save the long detour and climb to Constantine we decided to try it. The distance as given us was 150 kilometers (it proved to be 173), but as the actual state of the road was unknown and as there are no towns en route at which supplies of any kind can be obtained, we deemed it best to remain at Sétif over night and make an early start next morning. The gasoline reservoir was filled at a cost of 3 francs for the *bidon* of 5 liters (about 48 cents a gallon), and we started at 7:25 A.M. on March 18.

Sétif, anciently the Roman Sitifis, lies almost in the center of the high plateau of the Tel, which has already been described as extending east and west between the two ranges of the Atlas mountains. It is surrounded by a fortified wall, has a military quarter with barracks for 3,000 troops, and its native population of about 11,000 is about equally divided between Arabs and Kabyles.

The road from Sétif to El Kantara traverses the plateau of the Tel in a southeasterly direction and was described to us as very good. As a matter of fact, it was fairly good for carriages or wagons, but for automobiles it has too many ruts and inequalities that try springs and make rapid going impossible. One shoe and two inner tubes were our tribute to it. The country traversed is fertile when irrigated, but sparsely settled, with only a few small



A TYPICAL ALGERIAN SHEIK.

villages, along the line of the road. As there is no other source from which the information can be obtained, it may be useful to give our schedule of such places: Sétif; Mestong, 14 kilometers; Ampere, 50; N'Gaous, 87; MacMahon, 148; El Kantara, 173. At MacMahon our road merged into the national route from Constantine, and about eight kilometers from El Kantara a swift descent is made from the high central plateau to the level of the Desert of Sahara.

The Gorge of El Kantara (El Kantara means "The Bridge") has been famous since Roman times and has been more written about, perhaps, than any other spot in Algeria. What is most striking about it is that on emerging from its southern end the green oasis of El Kantara, with 90,000 palm trees, bursts upon the view, while away to the south stretches the arid level of the limitless desert.

Just at the northern entrance of the gorge is situated the small Hotel Bertrand. It is generally full, and persons desiring to stop there over night will do well to write or telegraph in advance. We reached it at 4 P.M., and as no rooms were to be had decided to go on to Biskra, after buying 30 liters of gasoline at 3 francs 75c. the *bidon* (about 60 cents a gallon).

Colonial Government Has a Thought for Desert Road.

The road across the desert to Biskra (58 kilometers) is on the whole much better than we had expected, or rather feared. In parts it is simply a camel's track. A small portion of it is over bare rocks where it seems impossible at first glance that any wheeled vehicle, much less a heavy automobile, should make headway; and there are ravines to cross which look as if no automobile could either get down into or climb out of them. The French Colonial Government is building a national highway between the two places, which is now finished for about half the total distance; and the finished portions are as good as any road in Algeria. In about two years, when this road is completed, the journey by automobile from El Kantara to Biskra will be one of the most novel and enjoyable in the world, for even under existing conditions it has a weird fascination. The desert surface is rather stony than sandy; there is a total absence of vegetation; it is a land with a face but no features; and one seems to be chasing the horizon into distances filled with mystery. As we surmounted one obstacle after another, the oncoming of sunset spread over the desert and the distant hills (for there are still hills) a wonderful canopy of color. Biskra, though we knew it must be near, was not visible until after a very steep climb over the last range of desolate hills through the pass of the Col de Sfa. From its summit we saw in the distance an oasis of vivid green that seemed to spread over half the space ahead of us (it contains 250,000 palm trees); above the green rose a white minaret and a tower; and far beyond to the south, unbroken as a sea horizon, stretched the level line of the real Desert of Sahara.

"The Queen of the Desert."

Thus the Arabs name Biskra, the capital and commercial emporium of the Desert of Sahara. Here the great caravan routes from the south converge; here ends the railroad that links the desert with the outside world; and here is the center of the French political administration. France's military outpost in this direction has been moved down to Touggourt, but Biskra is still the guardian and center of the Algerian Sahara. Being a fortified town with a garrison, the uniforms of the different classes of French troops, including that of the gorgeous native *Spahi* cavalry, are frequently seen on the streets. But the dominant note of Biskra, even in the European quarter, is not military or even European, but native. Here the native life is seen to better advantage than in any other easily accessible town of Algeria or Tunis. The Arabs are most numerous, but one may also see in considerable numbers Berberes, Bedouins, Bishriens, Touregs, coal black negroes, and Jews, with a few Turks. The Ouled Nails, who have a quarter to themselves and

whose dancing in the Moorish cafés is one of the sightseeing attractions of Biskra, belong to a tribe whose habitation is in one of the remote southern oases, to which they return after they have accumulated the requisite fortune in tawdry jewelry and strings of coins. The life they have led in Biskra and other garrison towns is no bar to their marriage subsequently among their own people; in fact, they are much sought after for the "dowries" they can bring, and are said, like the Japanese Geisha girls, to make good wives and mothers.

The Royal Hotel is a first-class establishment, built in the Moorish style, with a tropical garden in an interior court and surmounted by a tower from which a memorable view may be obtained, especially at sunset. There are four or five other hotels that may be described as good, and a number of lodging houses. All are apt to be crowded during the season from December to the end of March, and intending visitors should be careful to engage rooms well in advance of arrival.

An Enchanted Garden in a Desert Town.

Several small parks and gardens beautify the European quarters at Biskra, but the great show place is the Villa Benevent, which has been made famous by Robert Hichens' novel, "The Garden of Allah." No matter what expectations may have been formed of this wonderful garden, the reality is sure to surpass them. Situated on the edge of the oasis, directly on the bank of the stony river bed of the Oued Biskra, across which one looks to the arid expanse of the desert, it furnishes perhaps the most marvelous existing illustration of the wonder-working power of water upon the most inhospitable soil and of the teeming opulence of nature. Crowded with palms of every known variety; containing fine specimens of every tree and plant that will flourish in the tropics; challenging the eye with a color scheme that ranges from cool and restful greens through all the vivid tints of flowers and climbing vines, and soothing the ear with the ever-present murmur of running water; kept in immaculate cleanliness and order by a small army of gardeners; inviting to repose here in dense shade and there amid scintillating sunbeams sifted down through the canopy of foliage; and surrounded on every side by a wall or hedge that gives a sense of isolation and remoteness, it is the embodiment of a poet's or painter's dream of an earthly paradise. Created and now owned by Count Landon, a wealthy French nobleman, it is accessible to the visitor on payment of a small fee that places all the attractions of the garden at his disposal for a whole day or such part thereof as he can devote to it.

In the Vicinity of Biskra.

Two short excursions may be made by automobile from Biskra. One is to the Fontaine Chaude (Hot Springs), lying five miles away in a particularly solitary and jackal-infested part of the desert. We burst one shoe and two inner tubes in making this short trip, which renders any description of the road unnecessary. The other excursion is to Sidi Okba, a typical native town of 8,000 inhabitants, situated in an oasis twelve miles from Biskra, and noted for its mosque, which is thought to be the oldest Mohammedan building in Africa and which houses the tomb and shrine of the famous saint and conqueror, Sidi Okba, who in the Seventh century brought all Northern Africa, from Egypt to Tangier, under the rule of the Khalif.

Tougourt, the last outpost of France in the Desert of Sahara, 212 kilometers (about 132 miles) south of Biskra, in an oasis of 150,000 palm trees, has been reached by two or three autoists out of a dozen or so who have made the attempt. The road is little more than a caravan route, barely practicable at best and extremely bad in places. It would be useless for a heavy car to essay the trip. Gasoline and all other supplies for the trip there and back must be carried from Biskra, and for the benefit of automobilists it may be mentioned that at Biskra the price of gasoline is 5 francs for the *bidon* of 5 liters (about 80 cents a gallon).



AN ENGLISH VILLAGE: CRAWLEY, A PICTURESQUE HALT ON THE ROAD TO BRIGHTON.

LONDON, Oct. 1.—Another fuel test is announced by S. F. Edge to be run under the control of the Royal Automobile Club. It will be remembered that a few weeks ago Edge made comparative tests of the best grade of gasoline and a marketed product known as benzol. This week he will undertake a test of benzol only, a British fuel with a specific gravity of .880, and which is sold retail at about twenty-four cents per gallon. The trial will be a three-thousand-mile run over the Great North road, with a view to obtaining reliable data as to the effect of this fuel on the engine.

The recent tire pressure tests on the Brooklands track indicated that the air pressure in a tire made practically no difference to the speed of the car. Experiments were made with tires of 100 and 120 millimeters and with pressure varying from 35 to 100 pounds, without the speed of the car being affected. To get the maximum wear out of a tire it is necessary to use a pressure which sacrifices much of the comfort of riding. The Brooklands experiments, by proving that no speed is lost by low pressures, indicate that there would be an all-round advantage in the production of a tire capable of long use on a lower pressure than at present necessary.

Lessons from Britain's Commercial Tour.

BIRMINGHAM, ENG., Oct. 1.—Although the army of commercial vehicles united in the Royal Automobile Club's trials has been on the road eight days, it is too early to make any close deductions as to their mechanical ability or the ultimate results of the demonstration.

A certain number of enthusiastic salesmen appear to be disappointed that orders have not flowed in all along the line, forgetting that heads of business houses do not visit commercial motor exhibitions with a check book in their hands. Manufacturers in the western district, comprising such towns as Bristol, Chippenham, Worcester and Gloucester, are somewhat conservative and are not likely to change their methods of haulage before receiving full proof of the value of the new vehicles. Even Birmingham, important as it is commercially, is not a very good field for the sale of commercial automobiles and probably not until Liverpool, Manchester, Sheffield, Leeds and the smaller industrial towns of Lancashire and Yorkshire have been visited will any real business be done. It is to be regretted that the tour does not extend further north, for there is an interesting field to be exploited in the coal, iron and shipbuild-

ing centers of Durham and Northumberland.

The first public exhibition was arranged at the Old Avonside Engine Works at Bristol, a most difficult place to enter, the gateway leaving but a few inches leeway for many of the vehicles and the ground being so soft that the heavier trucks sank to their axles. Fortunately at the last moment Secretary Orde was able to arrange for the use of the spacious open-air cattle market, a perfect place for a public exhibition. It was not long before those having struggled into the old quarters backed out and invaded the new camp. One dollar per vehicle for two nights was not an excessive charge for good lodging. All the vehicles belonging to one firm are grouped together in the exhibition ground, thus giving an opportunity for an attractive business display. At Birmingham

the depot is the Aston Villa football ground, with city headquarters at an hotel adjoining the London and North Western railroad station.

At the last moment five vehicles found themselves unable to take part in the competition, bringing the number of actual starters down to 55. The two Fiat five-ton trucks did not arrive in England in time; the Wolseley-Siddeley ran off the road in the dark and rain when proceeding to the starting point and was damaged; the Turgan light delivery van was found to be geared too high for the hills and went out on the second day; and the Atkey-Gimson withdrew owing to a defect discovered in the center bearing of the gear box. There have been probably more mechanical defects than were expected, some of the best known firms being victims of breakdowns, as much to their own surprise as to that of the public. In several cases the managers of important companies, traveling on their own vehicles, have had a first experience of the cussedness of an automobile when put on the road without a preliminary tuning up. One of the 16-horsepower Darracqs was in danger of withdrawal owing to the fracture of a cylinder wall, but by reason of the prompt dispatch of a new casting from Paris—four cylinders in one piece—it was able to continue with the loss of two stages.

As the result of a collision with a steam tractor, a Durham-Churchill was in danger of retirement. After a delay of twenty-three hours, a non-stop run of 105 miles was made over the regulation route, and the main body was caught up, the driver and mechanic remaining on duty thirty-five hours without rest. Bad luck befell a one-ton Milnes-Daimler owing to the frequent bursting of the 36 by 6 inch steel-studded tires. Fixing these tires was a labor of several hours, and after two blowouts, in the first of which two men were injured, and in the second the rim was damaged, it was decided to withdraw the vehicle. There are three or four accidents to report, none of them, however, of a serious nature. At Birmingham a trolley car ran into the Dennis lorry, damaging the rear; a Maudsley slipped into a ditch near Alcester, but was brought out under its own power; the three-ton De Dion gave trouble on the hills and had to be temporarily withdrawn for changes in its gear box.

On the first day the percentage of those having clean scores was 70.9. This proportion had been able to leave the garage without adjustments, had not had any stops on the road for mechanical adjustments, or lost time from tire or any other kind of trouble. On the second day 38 per cent. of the vehicles



WOLSELEY PETROL-ELECTRIC TAKING A STEEP GRADE.

had perfect scores; the percentage was 52.7 on the third day; 54.5 on the fourth and 60 per cent. on the fifth. Thirty per cent. of the contestants went through the first five days of the tour with clean scores. An observer appointed by some rival firm was carried on each vehicle and was charged to note all stoppages, from mechanical troubles.

Frequently machines have gone astray on the road owing to the lack of signs and the inability of the observer to advise. In some cases this loss of road has led to excessive speeding on the part of drivers, simply through a desire to arrive at control on time, though late arrival did not bring any penalty. Generally the schedule is fixed to allow the vehicles to travel rather less than the legal rate of speed; in some cases it is distinctly low, as, for instance, in the three-ton class, where drivers are obliged to hold in their vehicles with disadvantage to their fuel consumption average and average efficiency performance.

Solid tires are not giving complete satisfaction. At least half a dozen different firms have had some difficulty and it would not be surprising if one or two firms dropped out before the end of the five weeks' demonstration entirely, owing to defects of solid tires. The test is not a normal one, for all the vehicles are constantly running under full load—many of them are largely overloaded—whereas in actual daily work they run alternately loaded and light. But notwithstanding this, tire upkeep is too high in several instances. None of the wheels shod with metal rims have given trouble up to the present.

CHAIRMAN THOMPSON DISCUSSES ROAD-TARRING.

"Road tarring has been treated scientifically and developed in a remarkable manner in England and France," said Jefferson De Mont Thompson, chairman of the A. A. A. Racing Board, in



A TAR SPRAYER AT WORK ON THE ENGLISH ROADWAYS.

an interview with THE AUTOMOBILE representative on his return from Europe. "Owing to imperfect methods, some of the earlier attempts at treating road surfaces with coal tar were far from satisfactory. The tar failed to act as a binder; it was injurious to the eyes of drivers, as was clearly shown during the race for the French Grand Prix of 1906, and it lay in small pools, where it could be thrown up by the road wheels, to the injury of finely-finished body work.

"This year the tarring of the Grand Prix circuit was perfect; there was no dust and the drivers did not suffer in the least. In England special attention has been devoted to the developing of perfected and economical methods of treating a road surface with coal gas tar, the competition held near London a short time ago bringing before the public a number of efficient machines. The road surface needs to be specially treated, the tar must be put on at exactly the right temperature and under favorable atmospheric conditions. In short, it is the substitution of scientific methods for a rule of thumb procedure.

"From observation of road surfaces in France before and after treatment with tar, I am convinced that the best of these processes, in addition to abolishing the dust nuisance, hold the surface of the road together as nothing else will. My experience is that pneumatic tires do quickly spoil roads that have first been cut up by horses and iron-shod wheels. The continual washing out of water and earth from every depression of the road quickly deepens the hollow until the top surface entirely disappears. When properly treated with tar the surface is held together in such a way that tires have very slight effect on the road. Treating a new road with tar increases the first cost but proves economical in the end."

MOTOR 'BUS VERSUS TROLLEY CAR.

The work of the motor omnibus is once again held to be that of feeding tramways and railways from outlying districts, and for heavy street traffic work the electric tramway is easily first says the *Engineering Record*. If motor omnibuses are made smaller than at present, the advantage will be still further with the tramways, so that again lower fares can be charged, which will once more react favorably on the results. The plain truth is that for street service the motor omnibus has never competed successfully with the tram. The advantage in carrying capacity is at present entirely on the side of the tram, and the additional facts that whereas the tramway authorities have to maintain the rails, the roadway between them, and a further margin, and are rated on the track, go again to show that as regards public advantage the trams are much to be preferred. Undoubtedly the motor 'bus will improve. A cheaper fuel and better construction are to be desired, and for the present, at any rate, it cannot compete with the electric tram for urban traffic. These views are upheld by Herr Vellguth, as to experiences in Berlin. Here petrol costs more than in London, where, by the way, it is still rising. In addition, as regards estimates, the short life of the motor 'bus is never properly allowed for. Depreciation allowances are usually quite inadequate.

HOW AN AUTO SAVED THE DAY.

Every newspaper man who has done general work and at some time in his career covered a railroad wreck will appreciate the plight of Houston newspaper men recently when news of a wreck thirty miles away was received at night and they found on trying to reach the scene that they would not be allowed on trains going there. When the Houston reporters tried to board a train going to the wreck they were ejected. For a time it looked like a case of no story. Just then one of them happened to think that Hubert S. H. Wilson, the owner of a Thomas Flyer, might be willing to help them out. Several minutes later Mr. Wilson, his brother, and the newspaper men were on their way to Strang, thirty miles away.

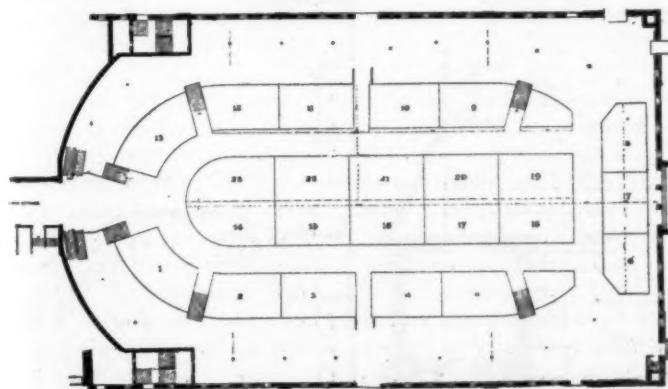


ARTISTIC DECORATIVE SCHEME THAT HAS BEEN ADOPTED FOR THE GARDEN.

IN the procession of varied events that hold forth in New York's largest show place, none has succeeded in so completely transforming the interior of Madison Square Garden as have the automobile shows in the past few years. All the familiar lines of the interior of the structure have been eliminated with a view to the production of a complete picture and at the same time a uniform setting. The idea adopted for the coming show, to be held November 2-9, is that of a terraced garden, and the criticism of former years has been heeded and an over-lavish scheme of ornamentation avoided. There will be less staffwork and on the whole a far simpler setting.

The color scheme is to consist of a blending of gray, crimson and white, the girders of the roof being screened by a canopy of the first-named color in place of the artificial sky of last year. The exhibition spaces will be carpeted with crimson, set off by the gray of the aisles. Entering from the foyer, the visitor will be confronted with a towering gateway, a replica of that of the Florio Torresca villa in Florence. It is to have real iron gratings and through them will be visible a garden wall and trees.

The plan of having the elevated platform above the arena boxes extend slightly over the main floor, and of covering the high rear seats to provide a mezzanine floor, will be repeated, and the idea further extended in order to gain more space by decking over the first balcony so as to have the flooring extend beyond the balcony railing, overlapping the elevated platform.



FLOOR PLAN OF THE MAIN EXHIBITION HALL.

LIST OF EXHIBITORS.

Main Floor.

1. Pope Motor Car Co.
2. Royal Motor Car Co.
3. Buick Motor Co.
4. Autocar Company.
5. F. B. Stearns Co.
6. Elmore Manufacturing Co.
7. Northern Motor Car Co.
8. Lozier Motor Co.
9. Knox Automobile Co.
10. Haynes Automobile Co.
11. Electric Vehicle Co.
12. Apperson Bros. Automobile Co.
13. Locomobile Co. of America.
14. Packard Motor Car Co.
15. Cadillac Motor Car Co.
16. The George N. Pierce Co.
17. E. R. Thomas Motor Co.
18. H. H. Franklin Mfg. Co.
19. Stevens-Duryea Co.
20. Peerless Motor Car Co.
21. Pope Manufacturing Co.
22. Olds Motor Works.
23. Winton Motor Carriage Co.

Elevated Platform

24. Waltham Mfg. Co.
25. Matheson Motor Car Co.
26. Walter Automobile Co.
27. Selden Motor Vehicle Co.
28. Alden Sampson, 2nd.
29. The White Company.
30. Corbin Motor Vehicle Corp.
31. Studebaker Automobile Co.

Exhibition Hall.

32. Babcock Elec. Carriage Co.
33. Studebaker Automobile Co.

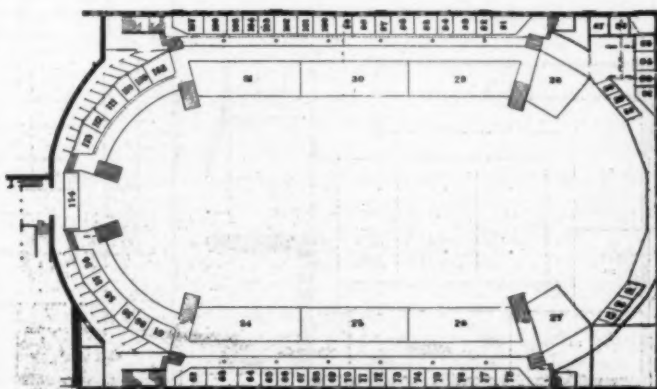
34. Rauch & Lang Carriage Co.
35. General Vehicle Co.
36. Pope Motor Car Co.
37. Columbus Buggy Co.
38. Electric Vehicle Co.
39. Baker Motor Vehicle Co.

Basement—Commercial Vehicles.

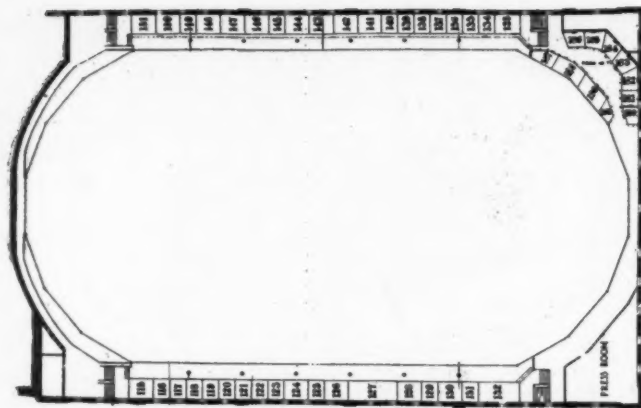
41. Knox Automobile Co.
42. Royal Motor Car Co.
43. General Vehicle Co.
44. Northern Motor Car Co.
45. Pope Motor Car Co.
46. Packard Motor Car Co.
47. Studebaker Automobile Co.
48. Alden Sampson, 2nd.
49. Champion Wagon Co.
50. Cadillac Motor Car Co.
51. H. H. Franklin Mfg. Co.
52. E. R. Thomas Motor Co.
53. Hewitt Motor Co.

Mezzanine Platform.
(Accessories.)

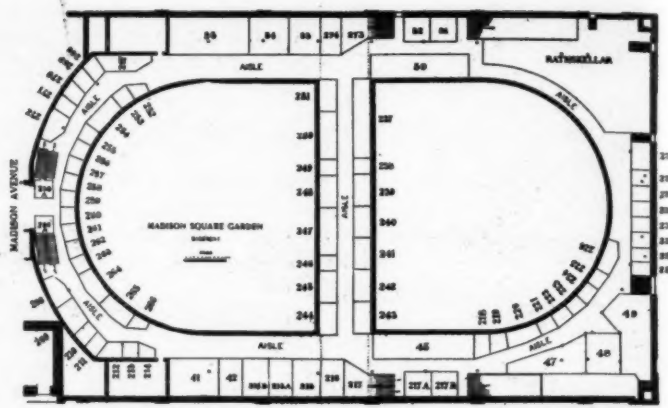
56. Diamond Rubber Co.
57. C. F. Splittorf.
58. Goodyear Tire & Rubber Co.
59. Shelby Steel Tube Co.
60. Dayton Electrical Mfg. Co.
61. G & J Tire Co.
62. Gray & Davis.
63. The Veeder Mfg. Co.
64. R. E. Dietz Co.
65. Atwater-Kent Mfg. Works.
66. Byrne, Kingston Co.
67. National Carbon Co.
68. Baldwin Chain & Mfg. Co.
69. Brennan Mfg. Co.
70. N. Y. & N. J. Lubricant Co.
71. Schwartz Wheel Co.
72. The Autocoll Company.
73. Hess-Bright Mfg. Co.
74. Webb Manufacturing Co.
75. Swinehart Clincher Tire & Rubber Co.
76. Light Mfg. & Foundry Co.
77. Warner Instrument Co.
78. Morgan & Wright.
79. Columbia Nut & Bolt Co., Inc.
80. Hartford Auto Parts Co.
81. Cook's Standard Tool Co.
82. The Auto Pump Co.
83. Leather Tire Goods Co.
84. Duff Mfg. Co.
85. Precision Appliance Co.
86. Stewart & Clark Mfg. Co.
87. Janney-Steinmetz & Co.
88. Chandler Company.
89. Globe Machine & Stamping Co.
90. Kilgore Manufacturing Co.
91. Firestone Tire & Rubber Co.
92. Oliver Manufacturing Co.
93. Hartford Suspension Co.
94. Phineas Jones & Co.
95. Jones Speedometer Co.
96. Pennsylvania Rubber Co.
97. Molsinger Device Mfg. Co.
98. Timken Roller Bearing Axle Co.
99. Warner Gear Co.
100. Remy Electric Co.
101. The Manufacturers' Foundry Co.
102. Brown-Lipe Gear Co.
103. Pittsfield Spark Coil Co.
104. Whitney Mfg. Co.
105. The Standard Welding Co.
106. The American Ball Bearing Co.
107. The Badger Brass Mfg. Co.
108. The Fisk Rubber Co.
109. Hyatt Roller Bearing Co.
110. Whitlock Coil Pipe Co.
111. Rose Manufacturing Co.
112. Midgley Mfg. Co.
113. Hartford Rubber Works Co.
114. The B. F. Goodrich Co.



ALLOTMENTS MADE FOR THE ELEVATED PLATFORM.



WHERE THE BALCONY EXHIBITORS WILL BE LOCATED.



BASEMENT ASSIGNMENTS OF SPACE ARE WELL ARRANGED.

Balcony.

115. Witherbee Igniter Co.
116. Joseph Dixon Crucible Co.
117. Valentine & Company.
118. Eastern Carbon Works.
119. A. R. Mosler & Co.
120. R. E. Hardy Co.
121. F. H. Wheeler.
122. O. W. Young.
123. National Battery Co.
124. The Edmunds & Jones Mfg. Co.
125. The Gilbert Mfg. Co.
126. The Uncas Specialty Co.
127. Bethlehem Steel Co.
128. Wm. Cramp & Sons.
129. J. H. Sager Co.
130. American Elec. Novelty & Mfg. Co.
131. Adam Cook's Sons.
132. Carpenter Steel Co.
133. The Republic Rubber Co.
134. Hotchkiss Mfg. Co.
135. Gray-Hawley Mfg. Co.
136. Weed Chain Tire Grip Co.
137. Winchester Speedometer Co.
138. The Lipman Mfg. Co.
139. Vesta Accumulator Co.
140. Spicer Universal Joint Mfg. Co.
141. Auto Improvement Co.
142. R. H. Smith Mfg. Co.
143. Herz & Co.
144. McCord & Co.
145. Index Speed Indicator Co.
146. Holley Bros. Co.
147. Gabriel Horn Mfg. Co.
148. Consolidated Rubber Tire Co.
149. Wm. C. Robinson & Son Co.
150. Standard Roller Bearing Co.
151. Noera Mfg. Co.
152. The Randall-Faichnev Co.
153. Isaac G. Johnson & Co.
154. Acetylene Company.
155. J. S. Bretz Company.
156. Voorhees Rubber Mfg. Co.
157. Manhattan Screw & Stamp- ing Works.
158. The Westinghouse Machine Co.
159. Breeze Carbureter Co.

188. Rushmore Dynamo Works.
190. English & Mersick Company.
192. Thos. Prosser & Son.

Concert Hall.

152. Sprague Umbrella Co.
153. Auto Accessories Mfg. Co.
154. American & British Mfg. Co.
155. Indestructible Steel Wheel Co.
156. S. F. Bowser & Co., Inc.
157. Rands Mfg. Co.
158. Springfield Metal Body Co.
159. Wm. J. Duane Co.
160. Pantasote Co.
161. The Prest-O-Lite Co.
162. Ajax-Grieb Rubber Co.
163. The Sherwin-Williams Co.
164. C. Cowles & Co.
165. Motor Car Specialty Co.
166. Gemmer Mfg. Co.
167. Wray Pump & Register Co.
168. Aurora Automatic Machinery Co.
169. Diamond Chain & Mfg. Co.
170. C. T. Ham Mfg. Co.
171. The Hoffecker Co.
172. Avery Portable Lighting Co.
173. Stackpole Battery Co.
174. Electric Storage Battery Co.
175. Hancock Mfg. Co.
176. Muncie Auto Parts Co.
177. L. C. Chase & Co.
178. Coes Wrench Co.
179. Conn. Telephone & Electric Co.

Second Tier Boxes.

193. Chas. E. Miller.
194. The A. Z. Company.
195. H. A. Allers & Co.
196. E. M. Benford.
197. Traver Blowout Patch Co.
198. John W. Masury & Son.
200. Antioak Tire Company.
202. Delta Mfg. Co.
203. Igniter Appliance Co.
204. Watres Mfg. Co.
205. Jeffery-Dewitt Co.
206. C. A. Shaler Co.
207. Continental Caoutchouc Co.

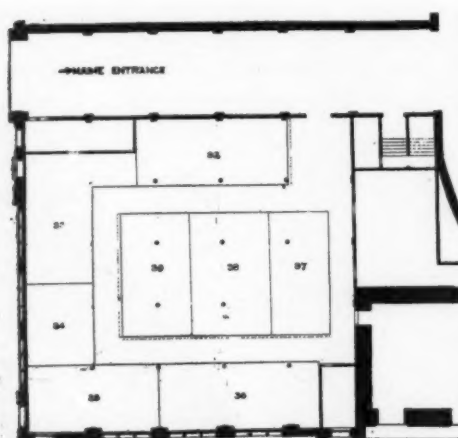
Basement.

208. New York Sporting Goods Co.
209. Michelin Tire Co.
210. Merchant & Evans Co.
211. Healy Leather Tire Co.
212. Robert Bosch, N. Y., Inc.
213. Havoline Oil Co.
214. Class Journal Co.
- 215-A. Dow Tire Co.
- 215-B. American Motor Co.
215. Blue Ribbon Auto & Carriage Co.
216. Amos Shirley.
217. Manhattan Auto Top & Body Co.
218. Gould Storage Battery Co.
219. P. Rielly & Son.
220. Lavalette & Co.
221. Lavalette & Co.
222. Pierson Motor Supply Co.
223. Albert Champion Co.
224. Columbia Lubricant Co. of New York.
225. Auto Supply Mfg. Co.
226. New Departure Mfg. Co.
228. Troy Carriage Sun Shade Co.
229. American Aluminum Coating Co.
230. Ventilated Cushion & Spring Co.
231. Glaenger & Co.
232. L. J. Muttly Co.
233. Charles J. Downing.
234. The Kalb & Berger Mfg. Co.
236. Leon Mann.
237. Hendee Mfg. Co.
238. Bicycling World Co.
239. Reliance Motor Cycle Co.
240. G. H. Curtiss Mfg. Co.
241. Light Mfg. Fdy. Co., Motor-cycle Dept.
242. Thomas Auto-Bi Co.
243. Pope Mfg. Co.
244. Reading Standard Co.
245. Ovington Motor Co.
246. Brown Mfg. Co.
247. N. S. U. Cycle & Motor Co.
248. Excelsior Motor & Mfg. Co.
249. Armac Motor Co.
250. Consolidated Mfg. Co.
251. Merkel Motor Co.

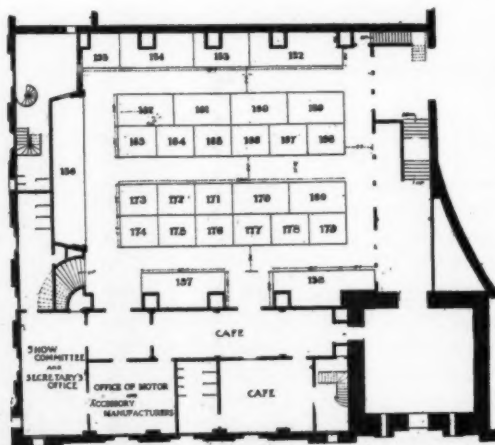
252. Automobile Topics.
253. Livingston Radiator Co.
254. National Oil Pump & Tank Co.
255. S. Smith & Son, Ltd.
256. A. W. Harris Oil Co.
257. Hopewell Bros.
258. Motor.
259. John T. Stanley.
- 259-A. Motor Print Co.
- 260-A. New England Automobile Journal.
260. Standard Brake Co.
261. Trade Advertising & Pub. Co.
262. Vacuum Oil Co.
263. Julius King Optical Co.
264. Patterson, Gottfried & Hunter, Ltd.
265. Empire Auto Tire Co.
266. Horseless Age.
267. Briscoe Mfg. Co.
268. Heinze Electrical Co.
269. Hicks Speed Indicator Co.
270. Comstock Shock Absorber Co.
271. Motz Clincher Tire Co.
272. The Post & Lester Co.
273. Norton Company.
274. Newmastic Tire Co.

Third Tier Boxes.

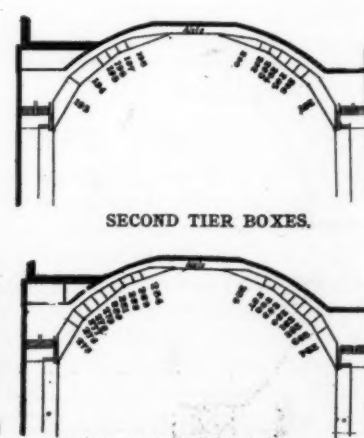
275. Kitsee Storage Battery Co.
276. Peerless Igniter Mfg. Co.
278. Allen Auto Spec. Co.
279. The Turner Brass Works.
280. Geisler Bros.
281. Ed. Dubled & Co.
282. Tavernier & Quezin.
- 283.
- 284.
285. Automobile Utilities Co.
287. Aluminum Solder & Refining Co.
288. Norris Auto Co.
289. Victor Shock Absorber Co.
290. The Atlantic Refining Co.
291. Loring Auto Appliance Co.
292. Empire State Tire Co.
293. Clover Mfg. Co.
294. The Perfection Spring Co.
- 295.
- 296.
- 297.



EXHIBITION HALL FOR ELECTRICS.



CONCERT HALL DEVOTED TO SUNDRIES.



THIRD TIER BOXES.

SCIENTIFIC TIMING OF AUTOMOBILE RACES*

By ALDEN L. McMURTRY.

IN a race having two or more competitors accuracy of timing is not of prime importance, unless a record is established, for the contest is won on place and not on time, and place is easily determined by the eye of the judges without regard to the timing system. There is room for error, however, even in placing the finishers in a close race between half a dozen or more contestants. But it is in record-breaking attempts and in hill-climbing trials, which are decided solely upon time, that scientific accuracy is required.

The watches called for by the racing rules and generally used for timing automobile events and horse races cannot indicate any divisions of time shorter than one-fifth of a second. This interval is much too long for the purpose, as a race can be won or lost or a record broken by a smaller period of time. The present mile record, made in January, 1906, on the Ormond-Daytona course, is 28 1-5 seconds. This represents an average speed of more than 187 feet a second. At such tremendous speed, a car travels very close to 37 1-2 feet in one-fifth of a second, or fully 2 1-2 car lengths. Now, if two cars were coming down the beach together in a competition trial so great a difference as this would be apparent to the judges and timers, and the second car would be timed at 28 2-5, but if the same cars made separate trials against time they might be tied at 28 1-5 seconds.

But most watches are not accurate even to one-fifth of a second; the movement has not a continuous, progressive motion, but the escapement wheel revolves by a succession of starts and stops, making two stops for each beat of the balance, just as some large tower clocks count off the minutes by the abrupt passage of the minute-hand from one mark to the next. If the stem of the stop-watch were pressed immediately after the escapement wheel had moved the time would be caught correctly, but should the stop not be pressed until the balance had almost completed its swing to release the wheel for the next stop, nearly a fifth of a second would be lost, and a car that had actually covered the mile in, say, 28 19-100 seconds might be caught in 28 flat.

Inaccuracies in Human Timing and Signaling.

Besides this factor of inaccuracy, or mechanical inadequacy, in the stop-watch, there is the human element to be taken into account. This may introduce a serious error, according to conditions. Some men are more adept at operating the stop-watch than others, and some are alert and quick of movement, while others are sluggish, so that a measurable time may elapse between the instants that three timers will press the stops on their watches for a given car as it crosses the tape. Unless the men who hold the watches are very expert, there is probability of error in determining the instant that the front wheels actually cross the tape. The fact that the three watches rarely agree to the fifth of a second is evidence of the inaccuracy of the present method of timing. Optical illusion also enters into the problem sometimes, especially in very fast record trials. This usually occurs only in the amateur timer, and is eliminated after an hour's constant practice.

Further liability of error exists in the ordinary methods of signaling the start and finish of an event. This is usually done by the firing of a pistol or similar means. In the case of any manually-operated system, some time is consumed in the transmission to the brain of the impression received on the eye. This interval will vary with different persons, just as the period required by the timers to catch the impression of the signal and actuate the stop watches will differ. If the start and finish are both in sight, and the timers take the time by vision in each case, the error will be nearly constant and the time accurate.

It is particularly difficult to time hill-climbing contests by the old method when the start is not in sight from the finish line. When the dropping of handkerchiefs or flags by four or five men stationed at turns is depended upon to signal the instant of start from the base to the top, the element of human error is greatly magnified.

It should be evident from the foregoing that far greater accuracy is required in timing motor car events to obtain indisputable results than has prevailed heretofore. All claims for world's records made in this country are accepted with the greatest reluctance by the governing bodies in England and France, whose rules are much more exacting.

Next to the flight of a projectile, the speed of a racing automobile is the fastest terrestrial movement that we are called upon to measure with precision, yet in the one case instruments are used that determine the rate even to the 1-1000 part of a second, while in the other the only method that is officially recognized in America is the use of stop-watches that cannot measure time to less than the fifth part of a second.

Automatic Timing Machines and Their Development.

The inaccuracies and unsatisfactory nature of the timing of automobile events by stop-watches manually operated were recognized years ago in France and England. The Automobile Club of France offered a prize of 1,000 francs for the invention of a device that would satisfactorily time automobile events automatically. This prize was won by M. Mors, whose instrument was used in some of the earlier trials against time in this country. This consists in an adaptation of the recording chronometer as used in observatories, with means for automatically registering the passage of a car across the start and finish lines. The record is traced by a pen on a strip of paper that is unwound by clockwork. The record can be measured to the hundredth part of a second, and the personal equation is entirely eliminated.

It was in the same year that the automatic timing apparatus devised by the author was perfected, patent applications being filed in June, 1904. This complete apparatus has three distinct functions: First, to time the event by starting and stopping split-second watches and moving the pen of a registering chronometer; second, to signal the start and finish by firing a gun, and, third, to provide telephonic communication all along the course. The problems involved are many, as will be understood from the foregoing summary of various timing methods in use and from the following explanation of the McMurry system.

In order to present the matter more clearly, we will consider the telephone system and timing mechanism separately. The operator at the start is in communication with the operator at the finish and the man at each intermediate station during every instant of a race by means of the wires used also for operating the timing apparatus. Each operator is provided with a transmitter, attached to a metal breast-plate strapped around the neck, and a receiver, attached to spring-metal straps that fit over the head and hold the receiver to the ear. The transmitter is held in a movable bracket having a cam edge-contact plate, so that when the bell-shaped mouthpiece is pushed down away from the face the circuit is broken and cuts out the sound of the gong, so that the operator can hear anything said by the other men on the line. Spring plug sockets are screwed to the case of the timing apparatus, so that quick connection of the telephones with the wiring system can be made. Use of the wire for talking does not interfere with the operation of the timing mechanism on the same wires, as the telephones are provided with condensers which make this dual operation possible simultaneously. In addition to the operators' telephones, there is also a special

*Extract from paper read before the Society of Automobile Engineers, Buffalo, N. Y., July, 1907.

patrolman's telephone. This is a small, portable affair, hung from a shoulder strap. It consists of a case containing an induction coil, with a trembler and condenser and a combined receiver and transmitter. The trembler is used for calling by giving a loud buzz in the receivers all along the line. With this instrument and a coil of wire, the patrolman can make a quick dash

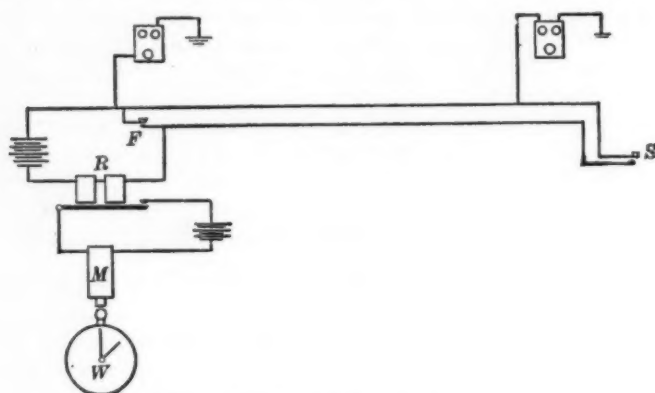


FIG. 3.—Wiring diagram of the open circuit.

on a motorcycle along the course to the scene of an accident or of trouble, throw one end of his wire over either line wire, stick the other end in the ground, and at once open communication with the operators at start and finish. There are believed to be only four of these instruments in the country, two of which are in use by the War Department.

How the Circuit Is Closed and the Time Indicated.

We may now proceed to a consideration of the means employed for closing the electric circuit when a car crosses the start and finish lines. Various methods have been tried. One of the earliest was employed at the record trials of the Automobile Club of America, on the Coney Island Boulevard, on November 16, 1901, when Henry Fournier established the world's mile record of 51 4-5 seconds. Here the closing of the electric circuit merely rang gongs, by the sound of which the timers started and stopped their watches. A rubber hose was laid across the course and connected with a diaphragm, so that when the air in the hose was compressed the pressure on the diaphragm would close the circuit. This proved unsuccessful, however, as it was found that the duration of compression as the wheels of a car passed over the hose was so short that the pressure communicated to the diaphragm was insufficient to close the circuit.

Finally, an automatic trap was devised that overcame all of these defects. The trap consists of a flat, rectangular box, to the top of which is secured a spring scales registering up to sixty pounds. To one end of the scales is attached a short chain that passes over a metal pulley, having a reduction of one-half, and is connected with a wire strung across the course. The scales are merely for the purpose of determining the tension of the wire, which is usually drawn to a tension of fifteen pounds, indicated as thirty on the scale. Mounted on the end of the shaft of the reducing pulley is a trigger arm that can be tightened on the shaft by a set screw after the trigger has been set. Engaging with the lower end of this trigger arm is a spring-actuated lever that, when released, makes contact with a stationary contact post, and so closes the circuit to start the watches of the timing instrument. At the same time another lever is released that opens the circuit, after a given interval, by means of clockwork, so that the watches can be operated again when the first car reaches the first intermediate post or the finish.

We now come to the consideration of the actual time-indicating apparatus. In its complete form, as first used at the Florida beach meet in 1905, this was arranged to operate six split-second watches. A later form, used the following year, is built for only three watches, as the officials did not care for the intermediate

times and the racing rules call for only three time-pieces. The original apparatus was also provided with an extra relay for operating a registering chronometer, but this was not used the following year, owing to the expense involved and the fact that, notwithstanding the chronometer would have given more accurate and permanent records of the events, the watches would have to be used any way, as there is no provision in the racing rules that allows timing by any other means than watches.

The six watches were set in a row on the panel and secured rigidly in position with clamp screws, so that the watches could be started and stopped by a set of plungers called "sweeps," acting on the stems, and the split hands operated by a set of smaller plungers, called "splits," acting on the escapement knobs. By means of an automatic current-distributor, all six watches were started simultaneously when a car crossed the starting line. Then when it passed an intermediate station three of the splits were stopped to indicate the time for that distance. At the next intermediate point the second three splits were stopped and the first three reset, and so on automatically to the end of the event, when all six watches were stopped. Forward of each watch, below the panel, were magnets which, when energized, actuated the sweeps and splits. Above the panel were two relays for closing the circuits through the battery and distributor.

Besides the apparatus and attachments already described, the mechanism was provided with a third relay for use in connection with a gun mounted on a standard in the timing stand for automatically signaling the start and finish of the race. The gun was a repeating shotgun, which had the stock and muzzle sawed off. After it had been fired it was merely necessary to move the grip to eject the discharged shell and load a fresh shell into the breech. Magnets were attached so that when energized from the batteries, through the relay on the panel by the closing of the circuit through the automatic trap, the trigger was depressed and the gun discharged at the same instant that the watches were started. A switch was provided for each relay and for the distributor. In addition, a milli-ampere-meter was secured to the panel, with a key to throw it in circuit, for determining the strength of the current at any time.

Merits of the Open Circuit and Loop Systems.

The wiring system of the timing apparatus is so arranged that by the movement of a single lever, operating several switches, the

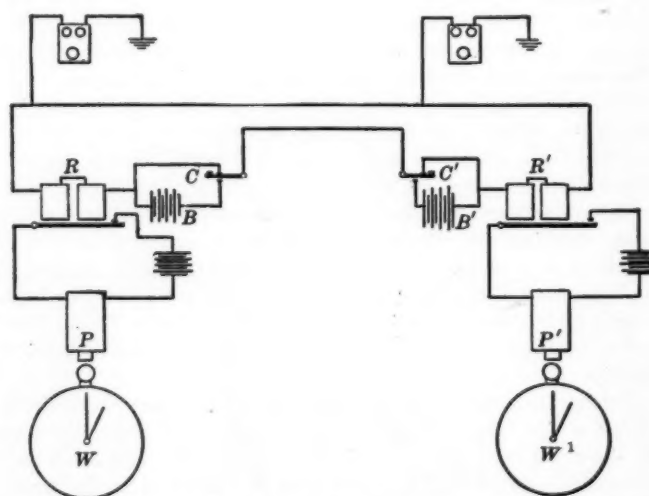


FIG. 4.—Loop system in the McMurtry apparatus.

system can be changed from the open circuit to the loop system. The open circuit is the simpler and cheaper, requiring batteries at only one point. A diagram of this system is shown in Fig. 3. The arrangement is the same as in an electric bell circuit having two push-buttons, a relay taking the place of the bell. When the circuit is closed at the start (S), the relay (R) is also closed and

the watch (*W*) is started through the action of a magnet (*M*) on the plunger. The same operation occurs when the circuit is closed at the finish (*F*), when the action of the relay stops the watch. So it is only necessary to close the circuit at any point to operate the watches. Against the simplicity of the open circuit are the manifest disadvantages that timing instruments can be used at only one end of the line, and that a crossing of the wires at any point will close the circuit and perhaps put the entire system out of operation.

In the loop system, shown in Fig. 4, the upper and lower contacts are used so that when both keys (*C* and *C'*) are up the two relays (*R* *R'*) are in the circuit. Upon pressing the key a line battery (*B* or *B'*) is inserted in the circuit, and this operates the plungers (*P* or *P'*) situated at start and finish, thereby operating the watches (*W* *W'*). With this system it is necessary to have a battery at each point where a telephone and timing key are to be placed. This is expensive and troublesome, but it has the advantage that as many instruments as desired can be used, and the line is protected against interference by outsiders or the accidental crossing of the wires, resulting in short-circuiting. By constructing the apparatus with the switch previously mentioned, it is possible to use either system as desired, without entailing any trouble in changing the wiring. There are condensers on the relays to prevent sparking, and external magnetism had to be guarded against to prevent magnetizing the watches.

An important feature of the apparatus is its portability. In Florida the instruments at times had to be taken up and transported twenty miles before the tide came up. The traps had to be changed frequently for races at varying distances, as from the kilometer to the mile, in the shortest time. One such change, including a run of 62-100 of a mile, was made in seven minutes. There is, of course, a lag in the mechanical operation of the

instruments, but this is a negligible quantity, since the lag at one end is balanced by that at the other. It has been determined by experimentation, for example, that there is a lag of 1-20 of a second in the series of operations, including the depressing of the wire attached to the trap, releasing the trigger, closing the circuit, the mechanical operation of the relay, closing the local watch circuit, operating the watch plungers and starting or stopping the watches. The firing of the gun is further delayed by the lag of closing the local circuit mechanical operation of the relays, closing the circuit to the gun, pulling the trigger and the consequent striking of the primer and explosion of the powder.

If the purpose of this paper has been fulfilled by showing that accurate timing of automobile events is necessary, and that it is possible to time them to the precision of the 1-100 part of a second by absolutely automatic electrical and mechanical means, whereby the personal equation and the shortcomings of the stop-watch are eliminated, the query will naturally arise: "If the apparatus can be operated successfully, why is such apparatus not generally used for timing important contests and record trials?" The sole reason why scientific timing does not prevail is because automobile racing is not on a sufficiently high plane of sportsmanship. The promoters of the meets are more interested in making them financially successful than in their scientific aspect, and will not pay the necessary cost of providing and operating the apparatus.

Credit for the successful operation of the automatic timing, as accomplished at various meets, is due mainly to Samuel M. Butler and J. C. Kerrison, who were officially appointed as timers, and to the efforts of A. L. Riker, Walter C. Baker and George L. Weiss, who replaced other timers, appointed because of their prominence in local affairs. Only the intelligent co-operation of these men has made accurate automatic timing possible.

THE DYNAMO FOR IGNITION WORK*

By R. U. SUTLIFFE.

THAT the dynamo will ultimately replace all other methods of electrical current generation for ignition purposes seems highly probable. The reasons which follow will, I trust, demonstrate that as a direct or indirect source of ignition current, its place in the ignition field is assured. Preëminently, the dynamo as a current generator is permanently self-contained and independent of outside assistance. Perhaps equally important is the fact that a dynamo may be readily designed to generate sufficient current for ignition work, while running at a speed of not over 1,100 r. p. m. It is therefore possible, in many cases, to start the engine direct from the dynamo, without the use of batteries, and thus upkeep expense is permanently eliminated. Furthermore, as is well understood, slow speed adds greatly to the life of bearings and moving parts and decreases the wear on the brushes and commutator.

For touch spark work, the dynamo may be used directly connected through the coil to the engine and will be found the most satisfactory method of ignition because of the higher voltage which it is possible to obtain before the circuit is closed. Owing to the requirements of a dynamo, it is advisable for jump spark work to supply the current to the coils from a storage battery. Without question, the current from an accumulator is best suited for a vibrating jump spark coil.

The dynamo is, for all practical purposes, the only method of keeping a storage battery in condition, and it will be found that one furnishing direct current at the proper voltage and amperage will be most satisfactory. Under any circumstances, a generator especially designed for the work it has to do is most recommended, and such a machine may be directly connected to the battery to be charged, without the intervention of a resistance of

any kind. A magneto will not charge a storage battery. The writer has found a surprisingly large percentage of cases where a small dynamo of the type referred to above is directly connected to a jump spark coil and used with absolutely satisfactory results, sometimes with the interposition of a lamp or two in parallel with the circuit. The reason why this is not always recommended is because of the fact that the condensers of some coils will not discharge against the inductance of the dynamo windings.

There has been some objection advanced against the dynamo for ignition work, as it is claimed they cannot, or have not, been satisfactorily driven. The output of a dynamo varies almost directly as its speed. It is therefore necessary on a variable speed engine to drive the dynamo with a speed governor, as a constant output is desirable. This can be and is accomplished in a number of successful ways, according to whether the dynamo is driven by belt, gear or friction. It takes but a trifle of power to actually drive the dynamo. Hence a very successful and reliable governor may be manufactured. The writer would state from personal observation that he has seen types of friction and belt-driven governors which would maintain the speed of the dynamo constant within a variation of 15 r. p. m. regardless of the speed of the engine. Inasmuch as there are about forty thousand mechanical generators driven by frictional governors on the market to-day, we hardly see how this method is other than practical. The dynamo for ignition work has been on the market over fourteen years. It has stood the test of time and of actual try-out in the field. Every indication points to the fact that the numerous advantages possessed by the dynamo over other forms of current generation for ignition work, both as regards efficiency, durability and economy, are such that it will eventually be universally used for work of this nature.

*Contributed by Dayton Electrical Manufacturing Company, Dayton, O.

INDIANAPOLIS TELLS OF COMMERCIAL VEHICLE PROGRESS

INDIANAPOLIS, IND., Oct. 4.—The large increase in the sale of pleasure cars in Indiana this year has been no greater in proportion than the sale of automobiles for commercial purposes. Dealers who have been watching for two years for a turn of the tide in interest in trucks and delivery wagons believe that it has come and that such vehicles will have a phenomenal sale next season. Until this year there were possibly twenty or twenty-three business automobiles in use in Indianapolis, with not more than fifteen or twenty throughout the State. In a single season the number has been more than doubled and sales are still being made in large numbers.

Heretofore inefficient drivers and cost of maintenance have been a drawback to the progress of business vehicles propelled by electricity or gasoline. But this season has been a campaign of education along these lines. Business men have been told that if they expected satisfactory service they must pick satisfactory drivers and pay them well. Where merchants have not cared to maintain private garages, public garages have sold them cars on a special maintenance contract, guaranteeing to keep their vehicles in service every day in the year at little more expense than the usual garage storage fee.

One of the most notable additions to the list of users has been the Adams Express Company, which has just spent almost \$40,000 in displacing horse-drawn service with electric delivery wagons of one and two-ton capacity. A private garage costing \$10,000 has been built and competent machinists and electricians placed in charge. The result has been satisfactory service at a cost small in proportion to the horse-drawn service.

Within a few days the Indianapolis Parcel Delivery Company, which makes a specialty of delivering small packages throughout the city, will place six delivery wagons in service, displacing practically all of their horse-drawn equipment. The N. A.

Moore Grocery Company and the Columbia Grocery Company, retail concerns, are the first of their kind in this city to use gasoline delivery wagons.

Another large concern to adopt modern delivery service is the Glossbrenner-Dodge Company. The Bartlett Trucking Company of Huntington have purchased three trucks, Goyert & Company of Greensburg two, and the Vincennes Automobile Company have bought one. The Fisher Automobile Company of this city has also purchased a large truck for its own use and the Atlas Engine Works has built a large gasoline two-ton truck for service around its plant.

The New York Store of this city has recently added a two-ton truck to its furniture department and is now negotiating for several delivery wagons for use in its general delivery work. For several years the company has used two electric delivery wagons that have given good service. Two automobiles were recently purchased by the local Police Department and they contemplate buying an automobile patrol wagon.

There has also been a noticeable increase in sales of automobiles intended to displace old stage lines. Frank Schwartz recently placed a twelve-passenger 20-horsepower 'bus in service between Seymour and Brownstown, and F. K. Beeson is running a twenty-two-passenger 'bus out of Connersville. Later on a 'bus line will be established between Greensburg and Clarksburg, displacing one of the oldest stage lines in Indiana.

It is probable that next season every dealer in the city will arrange for one or more commercial car agencies. Heretofore they have not handled them to any great extent, believing the time was not ripe. Practically all of the business this season has been handled by two or three concerns, who have been reaping a harvest and laying a foundation for the great expansion that is bound to come during the season of 1908.

OPPORTUNITIES IN AUTOMOBILE ENGINEERING

DURING the past year the writer has been in a position where his attention was called to the great number of young men, possessing more or less mechanical ability and engaging in various lines of work, who are desirous of getting into the mechanical branch of the automobile industry, says J. C. Austin in the *American Machinist*. Hardly a day passed that did not bring some applicant for a position as tracer, detailer or designer in the drafting department of a large automobile manufacturing concern. Of course, some of these were experienced in automobile work; but a great number were at the time, or recently had been, engaged in an entirely different field of mechanical work, but wanted, as many expressed it, "to get into the automobile line."

This is evident of the general inclination of young men to get into the rather attractive industry, where, as it appears to them, positions with "little work and much pay" may be had without very great effort. To be sure, many young men have worked from lowly beginnings to lucrative positions in the mechanical department of the automobile industry, but these "plums are picked" by men who began early in the race, before the existence of so much competition, and when the demand for men able to produce automobiles greatly exceeded the supply.

The automobile business sprang up as if by magic, and very few draftsmen and engineers had given this line of work much thought or attention. Those who had commanded good salaries, and in view of this fact many were drawn into the work. Automobile production presented an attractive field for capitalists, and numberless companies, offering as many positions, were formed. Up to the present time, or at least until very recently, this state

of affairs produced an abnormal demand for designers in this line of work. Now, however, the industry is settling itself upon a strictly commercial basis, where an employee to "make good" must be a producer; all who are not must fall by the wayside.

The writer does not wish to discourage any ambitious young man who is trying to get into, or is now doing, automobile work, for, for the fellow who is willing to work hard and long, there are many bright prospects ahead; but he does want to emphasize the fact that there is little encouragement to induce the average man, fairly well established in some other line of engineering work, to leave it and enter the automobile industry."

With their average speed of 23 knots, big liners burn 500 tons of coal every twenty-four hours; to achieve an increase of 10 per cent. or to get slightly in excess of 25 knots, it has been found necessary to consume 1,000 tons of coal in the same time. Of course, it is a matter of common knowledge that it does not pay, and the same thing is true of the automobile motor that is twice as large as it need be merely to gain an extra fraction of a mile an hour or simply to be big. It has been proven time and time again, and not a little to the chagrin of the owner of the large car on some occasions, that the light and low-powered car is not alone the equal of the high-powered and correspondingly high-priced cars in many respects, but actually their superior in some. In the A. A. tour of 1906 small machines got through where the most powerful cars failed. It is not alone a matter of power for weight; there is a limit beyond which the proportion no longer holds good.

LETTERS INTERESTING AND INSTRUCTIVE

FITTING LARGER CARBURETER TO A MOTOR.

Editor THE AUTOMOBILE:

[929.]—Inquiry No. 911 and your answer deal with a question that I have met. Please carry your answer to that inquiry enough farther to explain how one who has an engine that is intended for a one-inch carbureter can successfully attach to that engine a carbureter of larger size. For instance, if the pipes connecting the carbureter with the engine, and the inlet to the engine are constructed for a one-inch carbureter, can a larger one be successfully used without using correspondingly larger connections, and also correspondingly enlarging the inlet to the engine? My automobile was fitted by the manufacturer with a one-inch carbureter. Several manufacturers of carbureters with whom I have corresponded advise that engines having the bore and stroke which mine have require a 1 1/4 or 1 1/2 inch carbureter. At the same time, when I put to them the question above suggested to you, and ask if they will guarantee results if I replace the present one with one of their make and of the size which they recommend, they either do not answer the question or else sidestep it. TENDERFOOT.

Cambridge, O.

An extension of our reply to the letter referred to, as requested in your query, necessitates more data than was supplied by the inquirer in question. If the motor be a single-cylinder, with carbureter attached directly to the cylinder, procure a reducing joint to fit the new carbureter at one end and the inlet to the cylinder at the other. If a multi-cylinder engine, a new manifold may or may not be necessary. Even though a carbureter slightly too small for the motor may have been supplied in the first instance, the capacity of the manifold tubing may still be adequate for the larger size. Of course, the manifold should correspond with the output of the carbureter and be able to pass the volume of gas produced by the latter without difficulty, and without imparting too high a velocity to it as the result of a restricted passage, but it will doubtless often be found that the original manifold can be utilized in connection with a larger carbureter with satisfactory results merely by employing a reducing joint to bring the two together, as already described. If the capacity of the manifold be totally disproportionate to that of the new carbureter it should naturally be replaced, but this would not necessarily entail an enlargement of the inlet of the motor. It would doubtless be an advantage to make this change, but seldom advisable to do so merely for the sake of using a larger carbureter. The equipment of the latter with a new manifold, where really necessary, should give a maximum benefit with a minimum expense. When it comes to redesigning the motor itself, the game is hardly worth the candle, except to those with ample shop facilities and plenty of leisure in which to tinker.

HOW CAR MEASUREMENTS ARE TAKEN.

Editor THE AUTOMOBILE:

[930.]—Will you kindly inform me how the wheelbase of a car is measured? And also from what point is the tread measured? I have asked several here, and have had several different answers, but I should like to know the true measurements. I am really surprised at our own ignorance in this case.

Woodstock, Minn.

GEORGE MOLINE.

The wheelbase of a car is measured by taking the distance between the perpendiculars drawn through the hubs; in other words the point of contact between the wheel and the ground; literally the wheelbase. The tread is taken in exactly the same manner for the same reasons, for, the wheelbase being the distance longitudinally between the points at which the wheels rest on the ground, the tread is likewise the width of the car between these points when taken transversely. We find it difficult to conceive how such a query could elicit any other answer and are curious to learn the manner in which some of your informants would go about procuring these dimensions of a car.

SOME QUERIES ON NUMEROUS TOPICS.

Editor THE AUTOMOBILE:

[931.]—I find it necessary to call upon you again to set my mind at rest on some topics, on which I have been unable to obtain satisfactory information from other sources. I hope you will find it expedient to give your replies some space in "Letters Interesting and Instructive."

1. What is a high compression motor (expressed in pounds)?
2. Is it possible to increase compression (granted that valves are well ground) by any other method than by setting a plate in the clearance space in the cylinder head?
3. In a Packard "30," does the inlet close on dead center or before or after the suction stroke has been completed?
4. If the valve closes on dead center, would it help the speed of the motor to advance it a trifle to allow for the moment the piston is traveling over center?
5. In a Packard "30," where does the exhaust valve open? Is not most of the power already used after three-quarters of the stroke has been passed?
6. Will not speed be increased by giving a substantial exhaust lead?
7. Generally speaking, is a low compression or a high compression motor the faster?
8. Given a fast motor, is it not true that placing a plate in the cylinder head (without damaging the motor) will give more compression, giving more power to each impulse but less speed to the motor?
9. What are the gear ratios of the Pierce four-cylinder 28-32 and 40-45 on the high?
10. If a motor is synchronized with the magneto (as the Elsemann on a Packard "30") does it actually advance the spark (in relation to the stroke) by causing the magneto rocker to move farther than it normally moves at full advance?
11. At which point of the armature revolution is the current used? In diagram 1 or diagram 2?

AL. EISEMANN.

New York.

1. Sixty pounds to the square inch is a pretty high average for the automobile motor, so that seventy pounds or over may be considered high, particularly as the practical limit is 90 to 100 pounds.
2. The plate may be attached to the piston, though this is not advisable owing to the disturbance of the balance resulting. The connecting rods may be made longer, or longer pistons may be used with the same connecting rods.
3. Usually a short time after the suction stroke has been completed is the general rule, and we believe will be found to apply to the Packard.
4. It would help the power more than the speed, as keeping the valve open so much longer insures the suction of a fuller charge.
5. Exhaust valves are usually set to open slightly in advance of the moment the piston reaches the lower limit of its stroke. This is termed its *lead*, and, as mentioned above, we think this answers your question regarding the Packard.
6. Within reasonable limits, and where not already allowed for, the speed should increase; but where the lead has already been properly calculated, increasing it further might prove detrimental rather than otherwise.
7. High compression always.
8. If properly done, it should produce more power and more speed, as the former cannot be had without the latter with the same engine dimensions. Power is always a function of the speed.
9. The 28-32-horsepower car is geared 3.3 to 1 with touring body and 3.53 to 1 with limousine body. The 40-45-horsepower car is geared 2.88 to 1, 3.06 to 1 and 3.26 to 1, the first being for touring bodies, the second for limousines and the third a special hill-climbing gear.
10. The spark is not advanced in relation to the stroke by mechanical means, but as the generator voltage and current increase with its speed, the spark is stronger and occurs somewhat earlier as the speed of the motor increases. In consequence, it is advanced more than is indicated by the

position of the regulating lever, or more than is possible with the latter.

11. At neither; these are both dead points. The current wave is utilized when the armature is half way between the points shown in your sketches—that is, when it has emerged half way from the space between the field poles into the polar gap. It would then be at an angle of about 45 degrees to the perpendicular.

Note.—The sketches are not reproduced here, as they simply show a magneto armature perfectly horizontal in one position, and vertical in the other.

FROM AN ENTHUSIASTIC TWO-CYCLE ADVOCATE.

Editor THE AUTOMOBILE:

[932.]—Thanks for your reply to my letter. One question more through your valued paper: In the two-cycle engine or any other kind of engine, if a portion of the incoming charge is not consumed, would it not make a smell at the exhaust? I have read this criticism very often, and I have been trying to find if my three-cylinder Elmore engine was consuming all the incoming gas, by smelling the exhaust. I find the exhaust absolutely odorless, and I have been led to believe, on this account, that the combustion was perfect. Am I correct?

Also, if the engine did not consume all the incoming charge, would it not affect the power of the engine? I know of no engine of the size of the Elmore that has as much power.

From my experience I have come to the conclusion that as soon as the buying public become familiar with the merits of the two-cycle engine, when properly made, as in the Elmore, that it will be just the reverse; and the dealers will have a hard job in trying to make them believe that a lot of useless parts to an engine, such as valves, cams, springs, etc., add to the efficiency, when same can be dispensed with, and at the same time all the trouble they give be avoided.

CHAS. J. CHABOT.

Dallas, Texas.

Any unconsumed fuel would be perceptible at the exhaust in the shape of an odor of half-burnt gasoline, provided it were present in more than minute quantities. While all right as far as it went, your test is not conclusive. The time to get down behind and smell the exhaust to see if the fuel is being properly burned is when the car is running—in other words, when the engine is loaded. With the throttle closed, so that but comparatively small charges are being drawn in, almost any engine will run without a perceptible odor at the exhaust, unless in extremely poor adjustment. You are quite correct in assuming that the combustion was perfect with the above modification.

It would affect the power of the engine, but if the latter has been calculated with a liberal factor of safety for the work to be done, as is doubtless the case with your car, this effect would never be noticeable. The designers of your car have taken this factor into consideration in making their calculations, so that the motor will develop all the power needed independently of this. It could only be shown definitely by putting the motor to brake test.

WHAT IS THE DEPRESSION OF PNEUMATIC TIRES?

Editor THE AUTOMOBILE:

[933.]—What would be the maximum give in pneumatic tires when a car is running at an average speed over country roads? Would it be about the same on runabouts, light, medium and the heaviest cars? If not, how much depression would there be upon the tires respectively under the various weights?

Am I correct in understanding that all pneumatic-tired automobiles do not give over half an inch? Some light on the above queries would be much appreciated, as parties I have broached the subject to have not been in a position to give any positive information concerning it.

CHARLES E. MALINGS.

Easthampton, Mass.

Even with the requisite data at hand it would be a difficult matter to answer your first question definitely, but as it stands it is not susceptible of an answer at all. These are a few of the facts that should be known: The size of the tire, the degree of inflation in pounds per square inch, the weight of the car, the speed at which it was traveling, and the average height of the depressions in the road surface. Then the question would require two answers, viz.: The constant give

or depression of the tire due to the weight of the car and its load, which would depend upon the degree of inflation and the speed of the car, and its temporary give on meeting obstacles, which would constitute such a variable quantity as only to be accurately ascertainable with the aid of a specially devised recording instrument attached to the wheel. The factor of weight would cover the different types of cars.

Your impression is entirely erroneous, but the opinion is more or less prevalent that a properly inflated pneumatic tire seldom yields more than half an inch, and it is one that would appear to simplify the problem of devising a practical spring wheel. But the facts are quite different. It must be borne in mind that in a pneumatic tire the wheel is held in equilibrium between the road and the tread of the tire. The total pressure, due to inflation, load and speed, is distributed *round the entire circumference*, and the great superiority of the pneumatic tire is due to the fact that this entire ring of compressed air is brought into action every time the tire meets an obstacle. Air is constantly being displaced, but the rapidity with which expansion follows compression makes the process imperceptible to the eye. This is where most spring-wheel inventors go astray, by merely providing for give at the point in contact with the road instead of all round the wheel. Despite its high degree of inflation, a four or five-inch pneumatic tire on a heavy car will give far more than half an inch when driven over an obstacle at speed; in fact, it will give to the extent of its diameter, so that the bump of the rim on the road is very perceptible to those in the car. Thus far, your first question may be answered definitely, in that the maximum give of a pneumatic tire under such conditions is only measured by the diameter of the tire. The rubber and air at the point of contact are compressed and re-expanded so rapidly that if it were not for the very tangible evidence of the rim striking the road the fact would not be known and, at all events, it could not be measured accurately by the unaided eye.

AMBIGUITIES OF GEARING TERMINOLOGY.

Editor THE AUTOMOBILE:

[934.]—Will you kindly explain in your columns just what is meant by "six pitch," with reference to gears? I always supposed the number referred to the teeth per inch, same as so many threads per inch in screws. All reference works which I have consulted speak of pitch as "the distance between centers of two teeth at the pitch line." I have frequently noticed in the description of sliding gear transmissions that the gears or pinions are spoken of as being "six pitch"; I have also noticed in catalogues of gears full size illustrations of "six pitch" gears, and these appear to be about the size of transmission gears, yet the distance between centers of two teeth at the pitch line is a trifle over 1-2 an inch, making less than two teeth per inch. If you can explain what the number "six" signifies you will greatly oblige me. Of course I have found other numbers used in this same connection, but they are just as meaningless to the best of my ability in learning the exact meaning.

Minneapolis, Minn.

O. A. WEISS.

Used in this connection, the word refers to diametral pitch, a term which serves to describe a pinion by giving the relation of its diameter to the number of teeth on its periphery. In other words, the number of teeth divided by the diameter equals diametral pitch, usually expressed by simply prefixing the numeral to the word pitch. For instance, a wheel of 12 inches diameter at the pitch circle, and having 72 teeth, would be a 6-pitch gear. But the word pitch is used in several ways in connection with gearing, and it is scarcely to be wondered at that its frequent recurrence with apparently totally different meanings should be confusing. Probably the best explanation of the various meanings is that given by Kent, as follows:

"If two cylinders with parallel axes are pressed together and one of them is rotated on its axis, it will drive the other by means of the friction between the surfaces. The cylinders may be considered as a pair of spur wheels with an infinite number of teeth. If actual teeth are formed upon the cylinders, making alternate elevations and depressions in the sur-

face, the distance between the axes remaining the same, we have a pair of gear wheels, which will drive one another by pressure upon the faces of the teeth, if the teeth be properly shaped. In making the teeth, the cylindrical surface may entirely disappear, but the position it occupied may still be considered as a cylindrical surface, which is called the 'pitch surface,' and its trace on the end of the wheel, or on a plane cutting the wheel at right angles to its axis, is called the 'pitch circle' or 'pitch line.' The diameter of the circle is called the 'pitch diameter,' and the distance from the face of one tooth to the face of the corresponding tooth on the same wheel, measured on an arc of the pitch circle, is called the 'pitch' of the tooth or the 'circular pitch.'"

DATA CONCERNING TIRE-FILLING COMPOUNDS.

Editor THE AUTOMOBILE:

[935.]—A year or more ago I had two tires filled with Newmastic tire filling, which was done in Chicago. A couple of weeks ago I ran a puncture in one of them and the filling crumbled and about two-thirds of it came out through the hole before I noticed it. I sent it back but they would not refill it, and I am left with a good tire on my hands which I cannot use. Now if I knew the composition of the filling, I could fill the tire and use it until it was used up, and also fill my remaining two tires. I do not want to use it commercially, but only for my own use. I have experimented with glue, glucose and glycerine, and can get a splendid article all but one thing, and that is, it will melt if left in the hot sun any length of time, while their filling will not melt even on a hot stove. They say in their little booklet that "the compound consists chiefly of glue, glucose, and glycerine," but I know there must be something else used that will not melt by heating it. I do not know if I am asking more than I ought, but as I am a laboring man, with no excess of money, I thought if I could learn the ingredients, together with the proper proportions, of something that would do the business properly, it would help me considerably, and at the same time be of no injury to any one else, inasmuch as they refuse to help me out in any way. I am a subscriber of yours, and get so many good things out of "The Automobile" that I could not refrain from writing you on the subject.

ALVIN WALRATH.

Kalamazoo, Mich.

Just what this particular make of tire-filling compound consists of we cannot say, as every manufacturer of such substances has his own formula, which is a trade secret; but a composition which is said to be stable and serve the purpose excellently consists of glycerine and gelatinous silica or aluminum hydrate. This is more commonly known as water-glass, and is used in a liquid state in the proportion of three volumes of glycerine to one of water-glass. After mixing, the compound is further diluted with glycerine so as to be readily used. Granting that this is a good formula for the purpose, it is doubtful whether you can benefit by it, as such compounds are usually forced into the tires under considerable pressure and by special machinery. Then, again, it is necessary to extract all the old filling without damaging the tire, and probably the difficulty of doing this was the reason for the proprietors of the compound you mention refusing to treat your tire a second time. In fact, this is the great disadvantage of any tire-filling compound. Your tire may apparently be good, but doubtless it would not stand filling a second time and, though seemingly sound, has outlived its usefulness. Probably a new tire is your best remedy.

TAKING UP PLAY IN A LOOSE STEERING GEAR.

Editor THE AUTOMOBILE:

[936.]—My car is comparatively new, and has been taken care of properly, driven moderately and the like, so I think I may say it is in good condition. All adjustments were O. K. when taking it out of the garage a few days ago, but while traveling over a country road I suddenly felt the steering gear give in some way or other and was considerably alarmed, in view of the endless number of fatalities that are attributed to defects in this part of the car. On returning to the garage and examining the gear, I found that the steering wheel could be moved fully an inch in either direction before it had any effect on the front wheels.

I am aware that this is a condition that the majority of cars get into sooner or later, as can be proved readily to one's own satisfac-

tion by testing the wheels of a number of cars in any public garage. And I also know that if I take my car to such a place I will either be laughed at and told that such a thing needs no attention, or will incur a substantial bill of expense for something that I can doubtless do as well myself. At any rate, the job will be done more conscientiously, and certainly nothing on the car should be more carefully adjusted than the steering gear. The latter is what is known as the worm and sector type, and I would like to know how to go about adjusting it so as to take up this excessive backlash.

Greenport, Del.

STEERING GEAR.

As a car is running straight ahead for practically nine-tenths of the time it is under way, wear on the part of the steering gear is localized, so that after considerable service the parts of the worm and segment corresponding to a few degrees either side of the straight ahead position will be found to show wear, while the latter recedes very perceptibly toward each end, and at these points there is scarcely any apparent wear. Care must accordingly be exercised in adjusting such gear to take up lost motion by moving the worm and segment into closer contact; to see that they are not brought so close together at a worn point that they will bind when turned to a position at which there is still the original amount of metal. Herein lies the difficulty of properly adjusting an old steering gear, which has probably given rise to the indifference of the average repairman to such a defect. The driver of a car also becomes familiar with exactly how much further the steering wheel needs to be turned on this account to obtain the desired effect, and in consequence is scarcely aware of its presence.

Such conditions should not obtain on a comparatively new car, however, and it would appear that the adjustment of the segment-shaft bearings must be at fault. It is difficult to conceive how the gear could have given way to such an extent all at once otherwise, as wear at one point would only make itself perceptible gradually and after long service. We think a close examination of the gear will show that some adjustment has given or let up, and retightening it will remedy the difficulty.

CAN ALCOHOL BE USED IN STEAM CAR BURNERS?

Editor THE AUTOMOBILE:

[937.]—Can you inform me whether the burning of alcohol in any of its forms in steam vehicle burners is practicable? Also if there have been any experiments along such lines, and with what results?

EMMETT G. MURRAY.

Los Angeles, Cal.

There is no reason why alcohol could not be utilized for this purpose, as it is employed in various ways for heating. So far as we know, there have been no experiments of this kind undertaken, for the simple reason that up to the present the price of alcohol has not been such as to permit of its use as a fuel in competition with any of the substances now generally employed.

PASSENGER TON MILE DATA WANTED.

Editor THE AUTOMOBILE:

[938.]—Have you in your files any information regarding ton mile costs or passenger mile costs of motor cars using gasoline as fuel? Some time ago test runs were made under the jurisdiction of one of the automobile associations, to determine maximum mileage per gallon of fuel, and I thought you might direct me to the records made.

Any information you can give me, either as regards your own files, or other reliable source of information, on this subject will be greatly appreciated.

E. BROWER.

New York City.

The results of the two-gallon economy test, held under the auspices of the Automobile Club of America, were fully described in the issue of THE AUTOMOBILE of May 10, 1906.

To our knowledge there is no such data extant in this country, but a great deal of it has been compiled on the other side, and could doubtless be had on application to the secretary of the Royal Automobile Club, London, or the Automobile Club of France, Paris.

FROM ONE WHO WORKED WITH MR. SELDEN.

Editor THE AUTOMOBILE:

[939.]—In your September 26th issue a letter appears signed by Paul Lacroix, in which he endeavors to belittle the original Selden gasoline buggy.

Will you permit me, through your columns, to ask Paul Lacroix if he knew George B. Selden in 1877-78, and heard him at that time sit in his office and prophesy what has lately proven to be facts—that the automobile has almost displaced the horse in cities? He says: "Between such a car and even a mule, give me the mule." It is not a very gallant effusion, but it shows the tendency toward mulishness which Mr. Lacroix has shown with great fervor in his communication.

If we will but stop to consider that in 1877-78, when I saw George B. Selden's engine and knew the construction he was endeavoring to bring forth, which was before any such thing as a gasoline-driven automobile had ever been tried, we will wonder that Mr. Selden could possibly invent a car which would move at all. The writer superintended the mounting of this engine, which was partly built in 1877-78, and, even now, I will acknowledge that I am not only pleased but gratified to know that a car invented at that time shows as good results as it does.

That Mr. Selden is a bright genius has been proven many times, and many men have accorded him the compliment of being a very uncommonly bright man. Mr. Selden is a personal friend of mine, and I cannot resist taking up the cudgels in his behalf. Between the mule (P. L.) and the car, give me the car.

Perhaps Mr. Lacroix expected to prove a racing car was a touring car with immense power, but I dare presume to say that Paul Lacroix did not even notice that there is no carbureter in same, instead of which the gasoline is pumped into the combustion chamber. We all, both great and small automobile manufacturers, should take our hats off to George B. Selden.

Miami, Ohio.

O. B. HATFIELD, SR.

WHO WILL EMPLOY THIS AUTO SALESWOMAN?

Editor THE AUTOMOBILE:

[940.]—As a subscriber of your valuable magazine, I take the liberty of writing you a few lines. I am a young woman of education, good talker, fine saleswoman, who, having taken up the automobile trade, wish a place with some factory or firm, as chauffeur, or demonstrator, or will take a place in a public garage. I can do repair work; in fact, I worked side by side in the shop with the boys, and can get under a machine same as a man. I am willing to go any place on the globe to work, as soon as I can obtain a position in automobile work. I have tried to obtain work here in Chicago, but, so far, have been unsuccessful. Why is it that I should be discriminated against, simply because I am a woman? I am energetic, ambitious and more than willing to work, only wanting a chance to prove my ability and make good. I was in hopes I could get a chance to drive a car from here to Los Angeles, Cal. I know the trip would be full of hardships and an expensive one, but thought I could make it more than pay by stopping at principal places en route and selling cars, which I am sure I could do. I have a number of advertising schemes which I am sure would be of benefit to my employers if given a chance. They might as well take me into the game, first as last, because I have come to stay! I never give up anything I once undertake, and am not afraid of hard work; so hope to succeed in time. Now that I have explained myself, do you know of any firm or factory who would employ a real live one? I can furnish excellent references. I am going to try the West if I cannot get a position here in the East. Hoping you will pardon this lengthy letter, and may know of something favorable for me, I remain,

541 Wabash avenue, Chicago.

KATHRYN LOCKWOOD.

WANTED—SPECIAL CAR FOR THE SOUTH.

Editor THE AUTOMOBILE:

[941.]—If the Ford Motor Company could be induced to make a runabout with a 60-inch tread (the standard gauge in the South), I personally know of at least twenty-five people that would purchase a car. I have been unable to prevail on them to make a car of this gauge, and if you can furnish me with the name of some other dealers who are turning out a cheap, high-powered runabout that will make a car with 60-inch tread, something to successfully compete with the Ford, I will greatly appreciate the information, as I desire to secure the agency so as to handle the car.

The manufacturer who will put a first-class cheap car with "Southern standard gauge" on the market that can be used on other than hard roads will certainly greatly increase his sales. The roads are very good for a 60-inch car, as the sand is only a couple of inches deep, and the car can be placed in the wagon ruts and they run nicely with very much less gas than when driver is straddling the ruts with his 56-inch car.

Tallahassee, Fla.

T. A. AUSLEY.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

- Oct. 24-31.....—New York City, Grand Central Palace, Eighth Annual Automobile Show, Automobile Club of America and the American Motor Car Manufacturers' Association.
- Oct. 26.....—New Haven, Conn., Second Regiment Armory, Third Annual Automobile Show, New Haven Business Men's Association.
- Nov. 2-9.....—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
- Nov. 9-16.....—Philadelphia, First Regt. Armory, Automobile Show, Philadelphia Automobile Trade Association.
- Nov. 16-23.....—Baltimore, Third Annual Automobile Exhibition, Automobile Dealers' Association. B. R. Johnson, manager, Piper Building.
- Nov. 29-Dec. 6..—Chicago, Casino Garden, Second Annual Auto Parts Show. A. M. Andrews, secretary, 184 La Salle street.
- Nov. 30-Dec. 7..—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show, and First Annual Commercial Vehicle Show, National Association of Automobile Manufacturers.
- Dec. ———.....—Detroit, Riverview Park Auditorium, Detroit Automobile Dealers' Association. (Exact date to be announced.)
- Dec. 14-21.....—St. Louis, Mo., New Coliseum, Second Annual Auto Show, St. Louis Automobile Manufacturers' and Dealers' Association.
- Dec. 28-Jan. 4..—New York City, Madison Square Garden, Importers' Salon. C. R. Mabley, secretary and manager.
- Feb. 3-8, '08....—Buffalo, Convention Hall, First Annual Power Boat and Sportsmen's Show, auspices of Buffalo Launch Club. Dai H. Lewis, manager, 760 Main street, Buffalo, N. Y.
- Feb. 20-Mar. 7..—New York City, Madison Square Garden, Fourteenth Annual Motor Boat and Sportsmen's Show.
- Mar. ———.....—Boston, Mechanics' Building and Horticultural Hall, Boston Automobile Dealers' Association. (Exact date to be announced.)
- Mar. 9-14.....—Buffalo, Convention Hall, Sixth Annual Automobile Show, Automobile Club of Buffalo. Dai H. Lewis, manager.
- Mar. 21-28.....—Toronto, Canada, St. Lawrence Arena, Automobile Show. R. M. Jaffray, manager.
- Apr. 5-12.....—Montreal, Canada, Arena, Third Annual Automobile and Sportsman's Show. R. M. Jaffray, Mgr.

Races, Hill-Climbs, Etc.

- Oct. 18.....—Harrisburg, Pa., Middletown Track, Race Meet, Motor Club of Harrisburg.
- Oct. 19.....—Hartford, Conn., Charter Oak Park, Gymkhana Sports, Automobile Club of Hartford.
- Oct. 19.....—Kansas City, Mo., Kansas City Jockey Club Track, Race Meet, Automobile Club of Kansas City.
- Oct. 21.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize, Aero Club of America.

FOREIGN.

Shows.

- Nov. 11-23.....—London, Olympia Motor Show.
- Nov. 12-Dec. 1..—Paris, Exposition Decennale de l'Automobile, Grand Palais, Esplanade des Invalides, Automobile Club of France.
- Nov. 22-30.....—London, Agricultural Hall, Stanley Show.
- Dec. 5-22.....—Berlin, Germany, Automobile Show.
- Jan. 18-Feb. 2, '08.—Turin, Italy, Fifth International Automobile Exhibition, Palace of Fine Arts, Valentino Park, Automobile Club of Turin.

Races, Hill-Climbs, Etc.

- Oct. 1-15.....—Paris Electric Vehicle Competition, A. C. F.
- Oct. 20.....—France, Gallion Hill Climb.
- Nov. 1-15.....—France, Voiturette Contest near Paris.
- May 16, 1908....—Sicily, Targa Florio, Automobile Club of Italy.
- June 20-July 5..—Grand Prix, Dieppe Circuit, Automobile Club of France. (Exact date to be announced.)
- July 14, 1908...—Paris to London, Aerial Race.
- August, 1908...—France, Coupe de la Presse, Automobile Club of France. (Exact date to be announced.)



1908 REO ROADSTER, 18-20-HORSEPOWER, THE NEW LEADER OF THE REO LINE.

IN holding back the details of its new models for 1908 until just preliminary to the opening of the New York show season, it is quite evident from a perusal of the specifications of the new cars, as well as from their greatly improved appearance, that the builders of the Reo have been actuated by motives other than secrecy. In other words, they have had a great deal to uncover, for the new Reos represent a fitting advance over their predecessors in many ways. The line will consist chiefly of three models—the Model A, two-cylinder 18-20 horsepower, five-passenger touring car; Model B, 10-horsepower, single-cylinder run-about, and the Model C, 18-20-horsepower roadster, this last forming a most attractive addition to the line of two-cylinder cars now on the market, as will be quite evident from the accompanying photograph of it. It is not to be inferred from the fact that changes have been made that these are in any way of a radical nature, as such is not the case, the cars being the same in practically all their essentials as they have been since originally brought out.

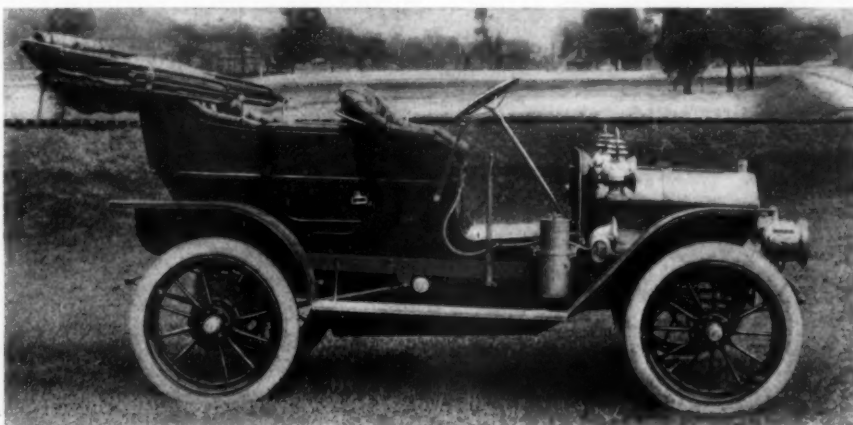
More room, more power and quieter running have been the aims of the designers throughout, and as a result the body of the touring car has been enlarged, the motor has been made more powerful, though still retaining all its distinctive features, and the gear-set has been made quieter running than ever, which is also true of the motor itself. The diameter of the wheels has been increased from 30 to 32 inches, and they will be equipped with 3 1-2-inch Michelin tires on Goodyear detachable rims, instead of the 30 by 3-inch standard equipment hitherto employed. This gives the car one inch more clearance and insures much easier riding and longer life to the tires, besides greatly improving the appearance of the car. In addition to the foot accelerator for the throttle, which has always been a feature of the Reo, an effective spark and throttle control is now placed over the steer-

ing wheel, affording all the convenience only to be found in very much higher-priced cars. The muffler, which is fitted with a cut-out, is no longer visible, having been located transversely at the rear of the car and over the axle. An improved style of fenders has been adopted, having liberal-sized flanges and aprons which afford complete protection for both the car and the hood. On the motor itself, a new and improved timer having roller contacts has been adopted, thus insuring better service from this essential, with greater durability.

Safe as the brakes fitted on the 1907 Reo proved themselves on the long and steep hills encountered in the A. A. A. tour, the braking system has been improved by the addition of an emergency rear wheel brake with improved brake lever, fitted in an outside quadrant ratchet with hand release. The driving mechanism has also been improved by the adoption of a noiseless chain, while the rear axle driving-shafts are now made with tapered ends for the reception of the wheels, which are locked on by keys and nuts, thus insuring positive reliability in this highly-important essential.

As the Model C roadster is being listed at \$1,000, it is evident that this will be considered as the leader of the Reo line and a review of its specifications will be of interest. The frame is of usual channel-section, pressed steel, supported on semi-elliptic springs forward and full-elliptics in the rear, the running gear consisting of 32 by 3 1-2-inch artillery wheels. As already mentioned, the latter will be fitted with 3 1-2-inch Michelin tires on

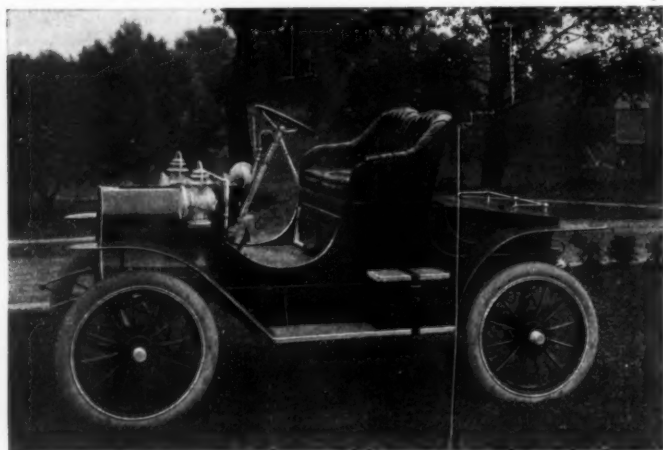
Goodyear detachable rims, this equipment being standard for both the touring and roadster types. The motor is of the twin-cylinder, horizontal-opposed type, the cylinder dimensions being 4 3-4 by 6 inches, bore and stroke, respectively, with a conservative rating of 18-20 horsepower at a moderate normal speed, which is made possible by the long stroke, the latter in turn only being made



REO FIVE-PASSENGER TOURING CAR, 18-20-HORSEPOWER.

possible on account of the location of the engine on the chassis. The cooling system consists of a tubular radiator supplied by a gear-driven pump. The valves are all mechanically operated and the moving parts fully protected. The carburetor is a special Reo design, while the ignition is of the high-tension type, using dry cells as the source of current. Lubrication is automatic.

As the first step in the transmission of the power, a multiple disc type of clutch is employed between the motor and the planetary gear. The latter provides the usual two speeds forward and reverse, final drive being by single chain, the differential being mounted on the rear axle. Three brakes are provided, all of them double-acting, the running brake being located in the driving sprocket, while the other two are in special drums on the rear wheels. The steering gear is of the worm and segment type and reversible. The car has a large running radius, as the fuel tank has a capacity of twelve gallons of gasoline; but four gallons of water are needed for cooling. The passenger capacity is two under ordinary circumstances, with a special folding seat in the rear, accommodating two more, and making it practically a four-passenger car. The equipment consists of three oil lamps, two Gray & Davis gas lamps, with B. & L. mirror lenses, generator, horn and complete tool and tire outfit. In complete running order its speed range is up to 45 miles an



FOUR-PASSENGER, 10-HORSEPOWER REO RUNABOUT.

hour. With a special top it lists at \$1,040, or the top separately may be had at \$50.

The remaining member of the Reo line is the popular single-cylinder runabout with its 10-horsepower motor, which has shown itself capable of performances entirely out of proportion to its size.

With some exceptions, its specifications are identical with those of the larger cars, in spite of its low price, \$650. For instance, the foundation of the chassis consists of an angle steel frame, while the suspension is three-quarter elliptic in front and full elliptic in the rear. Tubular roller bearing axles are fitted, the running gear consisting of 28 by 3-inch wheels, which will also be fitted with Michelin tires. Except that it consists of but a single-cylinder instead of two, the power plant is an exact replica of those employed on the larger cars and calls for no further description. This also applies to the transmission throughout, from the multiple disc clutch back to the driving axle. The gasoline capacity is six gallons and the car is capable of doing 15 to 25 miles on a gallon of fuel. Complete with folding seat, giving it a capacity of four passengers and with the usual equipments of lamps and tools, it lists at \$650 complete, and the continued popularity this small car has enjoyed during the past two or three years is ample evidence that the one-lunger of popular parlance has a place all its own and will be as much in evidence during the season of 1908 as it has been at any time since it was first superseded by the multi-cylinder models, with their high-powered engines and heavy bodies, which tend to make tire maintenance excessive.

SOUTHWEST ENTERS MANUFACTURING FIELD.

For the season of 1908, Texas will be a factor in the American manufacturing field. The newcomer hails from Houston, Tex., and will be known as the "Dixie Flyer." It is the product of the Southern Motor Car Company of that city, and the concern plans to assemble about 30 cars during the remainder of the present year, in order to fill orders already in hand, and expects to have an output of about 150 cars during the coming year. The company will devote its attention to a 25-30-horsepower, four-cylinder water-cooled chassis, and will supply it either as a touring car or runabout. The wheelbase will be 102 inches, the running gear of the roadster being 32 by 3 1-2 inches, and 30 by 3 1-2 inches on the touring car. The power plant will consist of the Reeves Model H, water-cooled motor, coupled to a Hassler transmission, as built by the Marion Motor Car Company, Indianapolis, Ind. Contracts have been entered into with other well-known makers of standard parts, and during the first part of its career this pioneer manufacturing concern of the Southwest will confine its attention to assembling, merely building the hoods, bodies and fenders in the home factory. Plans are also made to include a six-cylinder model in the line, and its details will be announced later. The model cars shown by the concern have met with a very favorable reception, and the outlook for an excellent business during the coming year is very bright.

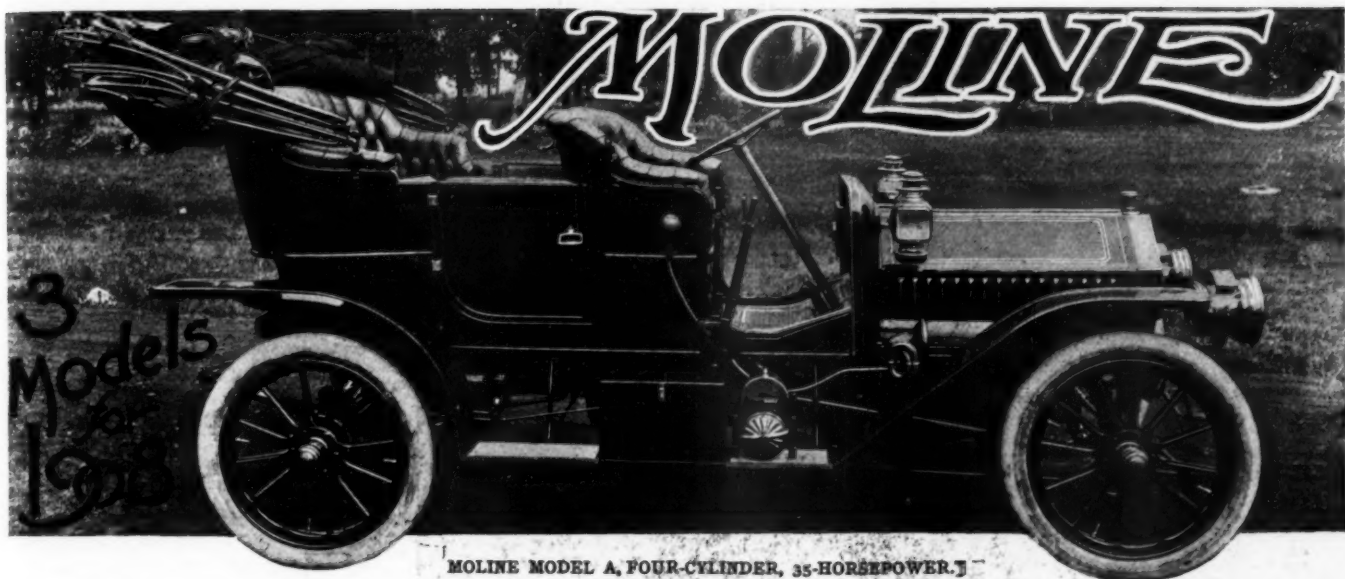
INDICATING THE FARMERS' AUTO INTEREST.

Next to the State Fair held at Columbus, the Wood County Fair held at Bowling Green is said to be the most widely known fair in the State of Ohio, although it is held in a rural district. T. F. McManus is a regular visitor to the fair and drove there this year in a Wayne "Thirty." On entering the carriage gate he was surprised at the number of cars, for there were almost as many autos as there were carriages, notwithstanding the fact that the crowded attendance consisted mainly of farmers. It was found on investigation that the same state of affairs existed at the other gate. The display of automobiles so excited the curiosity of the party from Toledo that the secretary of the fair was appealed to for figures, and it was found that up to that time 616 machines had been registered, which represented about half the total number that actually attended, as about that proportion failed to register. Turning back, the secretary showed that three years ago exactly three automobiles were registered. Pursuing the subject further, Mr. McManus was curious to learn if the majority of auto parties were not from the cities, such as Toledo, Cleveland and Columbus, but was informed that the proportion of urban machines was very small and that the majority belonged to dwellers in the rural districts.

A DETROITER'S PREDICTION FOR NEXT SEASON.

Charles L. Palms, chairman of the board of directors of the Wayne Automobile Company, Detroit, Mich., says:

"My belief in the statement that next season will be the brightest in the history of the automobile industry is based upon the fact that from a mere trailer and pupil of the foreign nations, the United States has at last come to be the greatest manufacturer and producer of automobiles in the world. From an output of 314 machines in 1902, this country has increased its operations till in the year 1906 over 60,000 machines were produced; 1907 is going to exceed that number, and 1908, according to my opinion, is going to exceed both. When the United States were turning out 314 machines, France manufactured 24,000 in the same length of time. In 1906, France manufactured 55,000 machines, or 5,000 less than did the United States. Not only has this country jumped into the leadership in output, but foreigners are coming here in a steady stream to get ideas and suggestions to improve the cars of foreign make."



MOLINE MODEL A, FOUR-CYLINDER, 35-HORSEPOWER.]

A PART from those minor detailed changes which are the result of changed conditions, or have been suggested by experience in the handling of a number of cars, the Moline line for 1908 will be practically a replica of the cars of the same make during the present year. The latter has proven so eminently satisfactory in every way that the designers have come to the sensible conclusion to let well enough alone. On the four-cylinder models there are a few changes in the appearance of the car, the most noticeable being those in the new form of radiator and hood adopted. For several years the Moline cars have carried a distinguishing feature in this essential, made after a design original with the builders. It was so arranged as to slide forward to uncover the motor, the construction being such that the radiator was entirely covered by the hood instead of standing out in front of it. For 1908 this feature has been discontinued and a standard type of folding hood adopted in its place, this also necessitating the employment of a different shape of radiator in order to conform to the lines of the former.

Another change in the cars comprising this part of the line consists of the adoption of a new style of mudguards or fenders, which are flat instead of flaring, and are so attached that there are no brackets or bolts of any sort on the under side that might come in contact with the tires. They are also provided with a drop on the inside to protect the body and the hood. They are finished the same as the remainder of the car and serve to make a decided improvement in its appearance as a whole. The mechanical side of the car has come in for as much attention as its appearance, and as a result there have been made a number of minor changes in the motor itself, which in themselves, however, are of such small consequence as to be scarcely perceptible to the Moline owner, but which in the aggregate serve to make the motor more powerful, durable and quiet running.

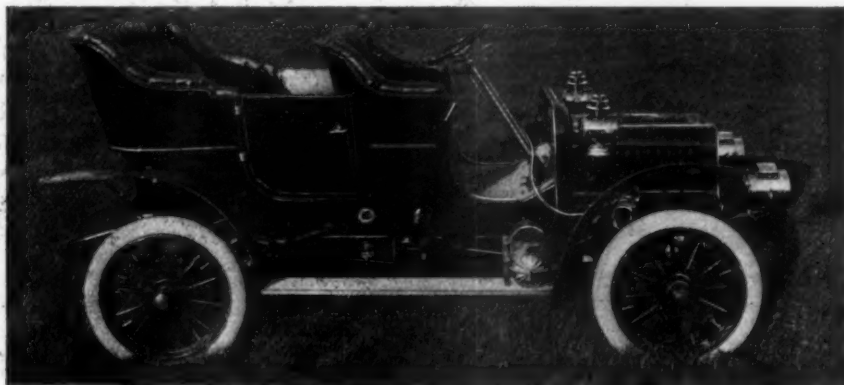
During the past year the two-cylinder model of the Moline met with unprecedented success and has been continued in exactly the same form and the same price for 1908 as has prevailed during the present year. The

motor with which this car is equipped embodies numerous distinctive features, and it is exceedingly well built throughout after a design that experience extending over several years and with a large number of cars has proven to be correct. It has ample power for its weight, easy riding springs and a well-proportioned body, which doubtless accounts for the excellent service it renders as well as its great popularity.

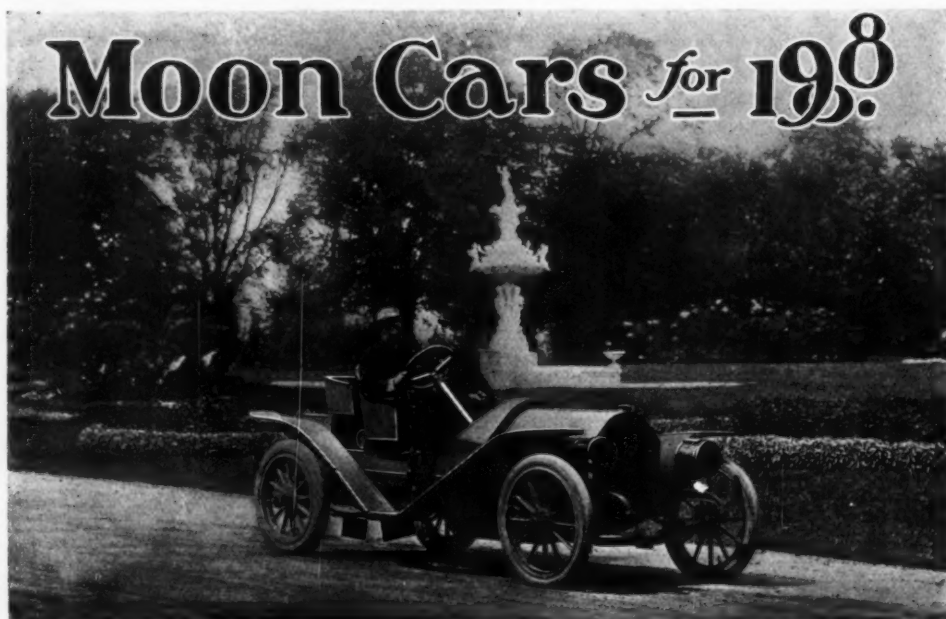
The four-cylinder cars are known as Model A and Model S. The latter is the smaller of the two and is equipped with a 24-horsepower, four-cylinder vertical motor, the cylinders being cast in pairs and measuring 3 7-8 by 4 1-2 inches. A three-speed sliding gear set is employed, and final drive is by shaft, the counter-shaft of the transmission being idle on the direct drive. It has a 100-inch wheelbase and 32 by 3 1-2-inch tires, front and rear. The suspension consists of a 31-inch semi-elliptic spring placed transversely forward, and two 42-inch full elliptics in the rear, using scroll heads. With the usual equipment, this car lists at \$2,000.

Model A is equipped with a four-cylinder vertical motor having a 4 1-2-inch bore by 5-inch stroke and conservatively rated at 35 horsepower, with a gear-set similar to that employed on the smaller car. The wheelbase of this larger model is 110 inches and 34 by 4 inch tires are used all round. Its remaining features are similar in the main to those of the 24-horsepower chassis. In complete running order it lists at \$2,500.

The Moline Model H completes the line. This is the double-cylinder horizontal opposed type, the motor measuring 5 by 5 inches and being rated at 18 horsepower. The gear-set is of the planetary type, providing two speeds forward and reverse, and is equipped with nickel-steel pinions running in oil. The car has a 92-inch wheelbase and 30 by 3 1-2-inch tires are fitted on all four wheels. The suspension and other features are similar to the other cars, and the same high-grade materials and workmanship employed on the more expensive cars are also used in the building and fitting of the two-cylinder model listing at \$1,250.



TWO-CYLINDER 18-HORSEPOWER MOLINE MODEL H.



DESIGNER MOOERS PILOTING THE 1908 MOON ROADSTER.

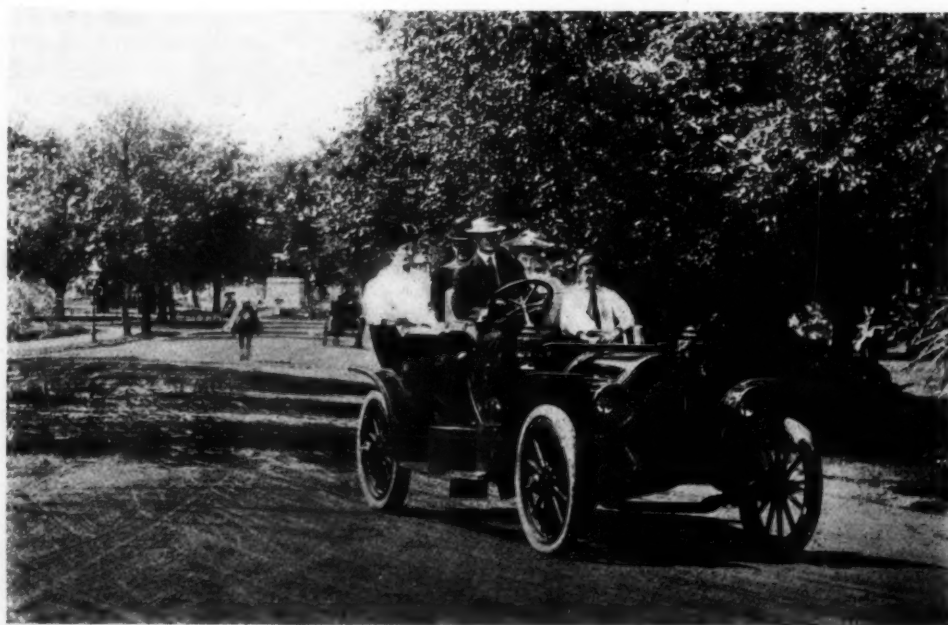
FOR the season of 1908 the Moon cars, made by the Moon Motor Car Company, St. Louis, Mo., will consist of three models. The main feature of the line will naturally be the standard five-passenger touring car; then there will be a special roadster and a seven-passenger touring car. Both the roadster and the smaller touring car have a 110-inch wheelbase. The former is hung very low and provided with full-elliptic springs in the rear, making it an exceptionally easy-riding car. The seven-passenger car will have a wheelbase of 121 inches, and the running gear will consist of 36-inch wheels, shod with 3 1-2-inch tires on the front and 4 1-2-inch tires on the rear, while the five-passenger car and the roadster will have 34 by 3 1-2 quick-detachable tires on the front and 34 by 4 1-2 on the rear.

In other respects the design of the Moon cars as originally evolved has been continued. Thus, the motor with its distinctive overhead camshaft and oppositely-disposed valves in the head, operated by short rocker arms, has been left unaltered, with the exception of small detailed refinement that has been found possible here and there as the result of experience, the design itself having proven eminently satisfactory and efficient. It will be recalled that in this motor the camshaft with its integral cams is located on top of the cylinders, where it is supported on three liberal-sized bearings. It is driven through bevel gearing and a vertical shaft at the forward end of the motor, directly from the crankshaft, this superimposed position eliminating many of the small parts otherwise necessary, and making for great simplicity of operation and quiet running, as but four rocker arms and four cams are necessary to actuate the eight valves. The ignition timer is located on the rear end of the camshaft, which brings it in a most accessible position. An important addition to this essential of the motor consists of the adoption of the Eisemann high-tension

magneto as a standard part of the equipment, the spark plugs being fitted with independent switches to facilitate testing.

The multiple disc clutch, which has previously been a feature of the Moon, has been retained intact. It consists of 53 discs, 26 of which are of bronze and the remainder of steel, each of the latter being made with three small spring projections, these insuring the ready separation of the discs in disengaging and preventing the clutch taking hold with a jerk. The clutch, as a whole, is encased in a bronze housing filled with oil, thus protecting it from dirt. Its diameter is very small, thus permitting the use of a large flywheel with fan-shaped spokes, while the self-contained construction of the clutch permits of its removal without disturbing other portions of the mechanism merely by the removal of three cap screws.

The gear set is of the sliding type with selective operation, and gives four speeds forward and the usual reverse through the customary single lever. The gear-set housing is of aluminum and is supported on a special subframe by projecting arms, permitting its removal intact without disturbing its connections. The pinions and shafts are all of hardened steel and the former are made with a central web, insuring uniform expansion in hardening. A universal coupling is interposed between the clutch and gear-set, while the cardan shaft is fitted at each end with similar joints to compensate for relative movement. These joints involve no screws or nuts and are enclosed in dust-proof, grease-filled cases. The bevel-driving unit is supported on ball bearings and is housed in the differential case, which is a steel casting with an easily removable aluminum jacket. Universal joints are also employed at each side of the driving gears and absolutely prevent binding, besides giving the great advantage obtainable by setting the rear wheels in at the tread 2 1-2 degrees, the same as the front wheels.



MOON MODEL MODEL C, ON A FOREST PARK ROADWAY, ST. LOUIS.

A STORY OF AN AUTO'S THOUSAND-MILE RUN

By E. RALPH ESTEP.

THE wise ones of New York's motor colony smiled and knowingly nodded towards the indefinite sunset place as, about 10 o'clock of an early Summer morning, a dirty blue automobile swung northward out of Long Acre Square. The loose Abe Lincoln shape of the man at the wheel supported a face that was mostly petrified smile, until you looked closer and read a determination in the eyes. It was a sure-enough Western outfit, come to learn the tricks of the wide, smooth Eastern highways. Car and driver had bumped, jumped, dashed and rattled over the uneven, sinister highways of Michigan and surrounding States.

The vehicle, prototype of the season's output of a great automobile factory, and its three fellow experimental cars, had proven their stability in abusive work where the roads are such only by the grace of name, and where speed is only a relative quality in ability to overcome obstacles. Now the car would show its full pace on interminable miles of smoothness, long gradients, and wide turns, which taunt the driver to take them at railroad speed and test to finality the theoretical quality of differential end thrust.

Out through the suburban seats of the almost-New Yorkers, the new Packard "Thirty," herald of 1908, fretfully picked a way through the restrictions of habited territory and dashed into the freer country. Then the spirit of the chase was on them all. The versatile pilot from New York forgot his past. Sailor, cook, teacher of his native Greek, automobile man, were all wiped out by his reincarnation into a detached being with senses only for the road ahead. Waldon forgot Detroit and letters on the sales manager's desk. The "Thirty" answered 'he wild phantasmal call of the road.

Through the orchard-like Connecticut countryside, past hedge-bound, peacefully slumbering rural homes, around macadam corners that tempted danger as they rose over rock-built hills or dipped into the fresh, green verdure of quiet valleys, the car attained the fullness of its speed.

A train came along, and with tooting whistle dared them to try their metal in merry joust. Mile after mile was swept into the trail of dust obscuring the past. Between the Connecticut villages, where the car was slowed to a staid and orderly gait and where the train hesitated to trade passengers, the race was repeated in unlimited miles at the rate of fifty an hour. Occasionally the ocean broke into the kinetoscopic picture. It was a new and glorious experience to Waldon. A peculiar education is needed to drive a car successfully over the smooth New England highroad.

It was three-thirty when the party burst into the civilizing influence of Hartford. Here they lunched, and at 5 started northward for the "Hub." The New York guide gave way to Fuller, the Packard exponent among the bean-eaters, with a doleful: "Gee, I wish I was going on to Boston." "Come along,"

said Waldon, and he clambered into the tonneau, heedless of the rough roads he knew to be ahead. Later, he tried, in rapid succession, all five seats in that tonneau and a few above it, as the car pitched and tossed over each rocky hiatus in the continuity of Massachusetts highway improvement.

Dodging the traffic which cluttered the streets of Springfield, the tourists followed another car whose dust-dimmed tag, by its alphabetical prefix, denoted the property of a Springfield automobile dealer. They ran close to it and asked to be shown the way to Boston. The driver answered "Sure," buttoned up his coat, pulled down his goggles and started out to do it. A somnolent cop at a cross street was taken unaware and left to think it over. The native car rushed a hill, and then the Detroitier realized that the man ahead intended to show him the road to Boston by a trail of dust. He ran alongside to make sure, again asking the way to Boston. The stranger nodded—but was behind at the top of the hill.

Once in the country the race began in earnest. The New Englander's valor had not reckoned on his competitor's prowess. Time after time the mad chase became a play, as the Western car passed the volunteer guide and then dropped back to give it another run. The beaten one stopped and mentioned a poor carburetor mixture. An offer to wait for it to be adjusted he waved aside with a gracious "You've got us licked, but ours is only a 30-horsepower car." "Same as ours," laughed Waldon. As though the formality had been overlooked before the duel, the principals exchanged cards, waved adieu, and the man who would have shown the way to Boston laconically pointed to the right fork in the road.

Fast, and without hesitation, the flight continued from Springfield to Worcester. Other motor traffic seemed as stationary as the houses, trees and little hamlets. A speck appearing on the horizon grew quickly to a motor car, flashed by, and was baptised in dust. The country took on the manner of ultra-civilization; villages became more frequent; church spires silhouetted against the gray-grown sky of early dusk; the road ahead sank into puzzling obscurity, and night put an end to the riot of color on the western rim of the world. But, also, in the deepening shadows of the east twinkled the lights of Boston. It was only half-past 8 when the car drew up at the Motor Mart, but the pilot was not hungry in spite of the rough trip.

Boston was inquisitive about the new "Thirty" and the car was given over to it the next day. In the evening, with eight aboard, fast as the car could go it repeated history in an unthrottled dash to Ferncroft Inn. It was over the Newburyport turnpike, built in 1578, at the order of the king, that the governor, on horseback, might ride straight as an arrow's flight to Newburyport. History must have winked at this latter-day interpretation of her original purpose.

Saturday was a dismal day. The gods had



"THE ROAD RAN ALONG RIDGES AS A NARROW SHELF, WHOSE END STRAYED OFF AND DOWNWARD INTO WATER-LIKE OCEANS OF CLOUDS."



"WITH RAILS, FULLER AND WALDON PRIED THE CAR UPWARD."

shut off the sunshine and Jupiter raved. There was none to go back with Waldon to New York, especially when he hinted at a mountain trip to Pittsburg. Finally Fuller and Graves dared each other to the sticking point, and just as the car was ready to leave the garage began telephoning their homes and hunting suitable apparel. Fuller was wrapped like a mummy in layers of store clothes, with a coon-skin sarcophagus. Graves wore the regulation rubber motor coat, adding a fanciful touch with a woman's rubber cap, ruffled à la bedtime.

Being full of knowledge *re* the highways and by-ways of Massachusetts, Graves took the wheel and started out in the pouring rain. He had no goggles. The water beat back the rubber ruffles that fringed his face, and rivulets of rain flowed down his neck. The car skidded some and slipped more. Into puddles where the water shot above their heads and increased their drenching, banging over bridges, skidding around sharp corners and following rain-filled ruts, Graves took them to Providence. Here they changed clothing and ate dinner. Then Fuller drove.

Straight and highly crowned, the road was not wide enough for two to pass—evidently the work of some narrow-minded supervisor. Coming suddenly upon a wagon widely loaded with the furniture of a farmer who had been careless in the choice of moving day, Fuller drove far out into the boggy ground at the side. She sank. "Keep her going," shouted Waldon. "Keep her going," echoed Graves, but, with a mighty splash and a great upheaval of mud, the car sank in the morass up to its all four hubs.

Luckily this was a region of stone and rail fences. With rails Fuller and Waldon pried the car upward, while Graves industriously lugged stones from the fence and built a solid foundation underneath. It was hot work. Finally the rock road was built and the car was driven onto the slender ribbon of macadam.

Waldon drove down toward the Atlantic and here the good road was lost in the sand and rocks along the coast. The road dodged among large boulders tattooed with advertisements—alternating with the protruding corners of orange-gray rocks on which the country is laid. Towards evening it was a dreary way, made still more depressing by the raucous complaint of the winds from off the now turbulent Long Island Sound. When New Haven was reached Graves evinced great desire to see the Yale University buildings and the domestic life of regular rah-rah boys. It was seven-thirty and so a stop was made for the night. Graves took the midnight train home.

Sunday morning, after a 10 o'clock start, Fuller and Waldon enjoyed a pleasant, sunshiny trip along the coast to New York. They spent only time enough in the Metropolis to eat a hurried lunch while a tire was changed, and, with a New Yorker on board

for pilot, headed for Staten Island to enjoy the good, pretty run to Quakerville. Out on the level highways of New Jersey, the testing of the car took a high speed turn. Perth Amboy to the Camden ferry was done in two hours.

From the garage at Philadelphia the Godshalks were telephoned—they who make motor boats and sell Packard cars. At the mention of Pittsburg the elder Godshalk wanted to go, but was finally induced to compromise on Clarence, young enough to stand the bumping which the mountain road prophesied. Another passenger was desired, and Clarence produced Bill, an ingenious friend, unused to wild, overland motoring. "Poor Bill," said Fuller and Waldon as they thought of what would happen to the innocent.

Godshalk pere advised a 5-o'clock start. Said he: "It is just as easy to bounce out of bed at four as at nine. All you have to do is to bounce." The start actually was made at five-fifteen, Fuller drawing by lot the first seventy-five miles in the front seat, with the two Quakers luxuriously reposing in the tonneau as the car rolled easily over the fine roads past Fairmount Park and Ardmore toward Lancaster.

It was a wet and cheerless beginning. The pervasive moisture robbed the matutinal venture of its rightful charms. The roads were good and ahead lay the mountains, taunting them to come and test the stuff that cars are made of. Somehow or other the call of the cook-stove was stronger, and with eager eyes they searched each paltry puddle of huts for a restaurant sign. At Coatesville they found it, and Waldon and Fuller were garrulous in their talk of breakfast. Uninitiated Bill only smiled. He had had his. The restaurant was just opening for the day, and Waldon fried eggs while Fuller concocted a sepia-toned liquid yclept, in kindness, coffee.

Near Lancaster a turn was made away from the Harrisburg road, southward towards Gettysburg. The Susquehanna at Columbia looked muddy and sullen in the rain-drenched atmosphere of full daylight. Here the road crossed on the Pennsylvania Railway bridge, a mile and a quarter long, with its tracks in the center and the ties boarded over to provide roadway wide enough for one, but not two, of anything to pass.

The tortuous line of oozing mud between the highway fences led southwest to a country of tender memory. At Gettysburg, the National Park and on to Chambersburg the leaden inertness of the chill rain seemed to become vibrant with echoes of the war. Thoughts motoring became much mixed with thoughts now resurrected from school books for verification in the very place of their beginning. At Chambersburg a new supply of gasoline was obtained. The mud-caked radiator was doused with water from a pail and scrubbed out with a broom.

Now began the real battle against the elements and the fortresses reared by nature in a harsh land—a land of many mountains and a few people. These people, too, seemed strange to visitors and to motor cars. They talked in nods or monosyllables and were surely stunned by this mud-smeared creation of an outside world which splashed through the almost impassable country with amazing speed.

The first climb into the Blue and succeeding mountain ranges was a long, steady pull of four and a half miles to the top of Cove mountain. As yet no anti-skid chains had been put on the tires, and the car veritably slipped up the mountain. The roadstead was an endless chain of "thank-ye-marms," fifty feet apart. Clattering over the uneven bed of rocks, skidding and sliding and bumping along the wind-racked, rain-soaked mountain side, the car passed several teams working hard their discouraging way, and whose every driver would declare future progress of the motor car soon would be impossible.

Once a buggy was passed and the driver tried to hold the speed of the car as it set the jarring pace upward. Of course he tired out the horse and quit, but at the mountain top, where the motor car had been stopped that tire chains might be put on, he came up and waited so that the automobile would not have to

pass him on the dangerous downgrade which seemed to be merely a rough and slippery path cut around the edge of the precipitous mountain wall.

As the car started down the 18 to 20 per cent. grade, some fiendish instinct in the native, or, perhaps, a booze-built desire to show his mountain skill and general dare-devilishness, prompted him to whack the unfortunate horse into a wild run. Dancing over "thank-ye-marms," hitting, dodging and scraping the huge boulders which littered the road, striking the jagged corners of rocks turned edgewise at the surface, the car careened madly down the slope. Close behind it came the buggy, flung high at each "thank-ye-marm," swinging from one side of the road to the other with each rapidly succeeding lurch, crowding the horse in his vain endeavor to hold the difficult pace over the heart-breaking path, the wheels vibrating until it seemed they could no longer stand the abuse. At the bottom of the long flight appeared a toll gate, but so close behind was the runaway buggy that a stop spelled disaster. Waldon pulled the car to the side of the road, ran back of the gate-keeper's house and the buggy whizzed by, to disappear into another mountain trail.

Mountain ridge followed mountain ridge, and between them were fifteen-mile stretches of hills. Only ten miles on all the way from Chambersburg to Pittsburg were level. Ever climbed the car through the continual rain, over roads built only of rock. It was like the bed of a river. As far as the eye could reach, flat stones, gathered between the fences and laid side by side to form ridges, were interspersed with the bald, slippery knobs of huge boulders. "Thank-ye-marms" became an obsession. Reckoned carefully, there must be nineteen thousand between Philadelphia and Pittsburg. Waldon drove the car obliquely over them, zig-zagging along the road to lessen the impact.

Bill was the surprise of the party. Innocent though he might be and unbroken to the hardships of testing tours, there was no yellow streak in him. When he opened the rain-soaked lunch and found it filled with gravel thrown into the car during its plunges into watery holes, he laughed—and pointed out a small mountain village wherein lived a school teacher of youthful and tender recollections. When the tire chains broke he was the first out to fix them, the while chattering of his once best girl that lived in the particular neighborhood. In fact, nearly every mountain peak or every bunch of scrubby trees which still reared their rickety limbs against the elements reminded Bill of some bit of fluff who had held hands with him in his youth.

Teams were scarce now, but occasionally there would be an encounter to lend a touch of humor. Once a farmer, coming up the steep grade, raised his hand and the car was stopped. The motor was shut down, and, on the farmer's signal, the car coasted noiselessly past, while the farmer held his horse by the bridle. Suddenly the horse, with deliberate maliciousness, pasted both back feet into the dashboard of the buggy, although the car was fifty feet down the road. The farmer's wife jumped out and, as the car slid down around the curve and out of sight, yelled: "I'll bet somebody'll pay for this!"

A tire burst at the foot of the last mountain ridge. An hour and a half was spent in making the repair, and it was dark when the last climb was started. The night gathered quickly, and was full of a thick solemnity. The headlights cut an uncertain, discouraging, rock-floored aisle through the everlasting gloom. The climb continued through clouds that made a fog against which the lamps were as impotent as though their light was thrown upon an opaque sheet. Coming out above, the road ran along ridges as narrow as a shelf, whose end strayed off and downward into the water-like ocean of clouds which floated unceasingly about the immemorial peaks.

Progress was slow and dangerous, yet there was a certain enchantment following the whimsical way which led now below, now above, now down through the clouds where that officious beldame, Fate, held the safety of the car and its occupants in her hand. The rays from the headlights were absorbed in twenty feet. Waldon steered through the fog by watching the telephone

poles alongside the road, which were the only visible objects. Once, following the poles along the inside of the narrow ridge that was the road, unable to see the edge—beyond which was death—the guiding line switched to the precipice side of the road, and the driver, not knowing this, followed their course almost to disaster.

Many times in making the uncertain descents with no knowledge of what was ahead, there would suddenly jump out of the enveloping fog the abutments of a bridge just far enough apart to let the car pass through. Sometimes a mountain waterfall would give warning of a bridge, but among the crooked walls of rock the sound gave no certain knowledge of location.

As the road finally dropped for the last time below the cloud fog and debouched into the wide valley where was a leveler, though not a level land by any means, the car struck what certainly must be three miles of the worst road in all the United States. It is just east of Ligonier and the business of the people is log-hauling. Wagons go down hill in the soft mud, which helps the brakes to retard them against the influence of the grade. Continual driving of this kind has made the road a river of mire, full of rocks—some buried, some protruding. They scraped the running boards, hit the hubs and stopped the car until they were laboriously lifted from their tomb of mud and thrown to the side. Here travel was at the rate of three or four miles an hour. Through the fearful uncertainty of the last descent two hours had been consumed in making thirteen miles.

It was nearly 11 o'clock when the lights of Greensburg were sighted. Waldon turned to commiserate with Bill, who had been given such an heroic introduction to motor touring, but there was Bill, still eager and happy, still unstunned—humming to himself the words of "In the Good Old Summer Time," set to a new and wonderful tune, syncopated, against his will, by the bouncing of the car. "Billy Bounce!" That would be it—the nickname of this as yet unchristened car. And Billy Bounce it became, officially and with a cup of coffee ceremoniously spilled over its bonnet before a Greensburg restaurant.

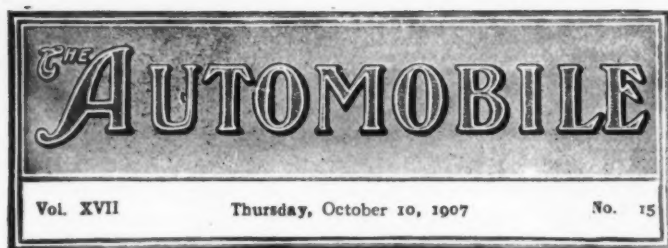
Two Greensburg hotels turned down the mud-calcimined quartet on sight. Consequently at the third place Bill left his outer garments in the car, while, more or less clean, he went in alone to negotiate for beds. Even there mine host required that they wash in the public lavatory before ascending to their rooms.

* * * * *

The next morning there was an easy run of thirty-two miles into Pittsburg. The 343 miles over the Alleghenies had been accomplished. Waldon was satisfied. Fuller was satisfied. Bill was satisfied. The car was turned over to a factory man to be driven home. Waldon and Fuller climbed onto a train for Detroit and the last they saw of Bill on the depot platform his smile had broadened into a cheerful grin as he jumped up and down in imitation of his "thank-ye-marm" experience of the day before. "Good old Bill—Billy Bounce!"



ENTERING PITTSBURG AFTER CROSSING THE ALLEGHENIES



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In the Consideration of the Track Racing Question. High-speed racing on circular tracks, originally constructed for horse racing, is now attended with the element of danger to such degree that men who value human life cannot be censured for hesitating at further encouragement of what must stand convicted, because of the growing list of fatalities, of being a reckless form of sport. When the limits of skill must be exceeded to bring victory, or the opportunity for so doing irresistibly tempts the contestant, then sane sportsmen must admit that the place for calling a halt has been reached.

Furthermore, the officers of the American Automobile Association are proceeding properly in consulting the manufacturers, who are directly or indirectly responsible for the greater part of the entries, and the clubs of the association, which in the past have conducted most of the meets.

Racing being a spectacular proposition, it is bound to receive a vast amount of publicity and attract the attention of the public. The attention which it has been commanding of late is more harmful than beneficial. But the question should receive—and it undoubtedly will—judicial consideration, not alone for the good that has been accomplished in the past along with the bad, but also for what may be retained for the future.

Granted that it may be politic and logical for the A. A. A. to refuse in future its sanction and jurisdiction over this kind

of track racing, it is a certainty that there will continue to be more or less use of the horse tracks for automobile events until other provision is made in the way of special courses. Local clubs would appear to be the proper ones to look after a less strenuous form of competition, and it appears to be a foregone conclusion that track racing is destined to be less strenuous and more local in character than ever before.

**Trend of Motor Design for the Coming Year.**

Now that the show season is practically upon us, it seems opportune to ask: What, if any, will be the changes it brings forth? It is safe to say that never in previous years, not even excepting last year's shows, was there a time in which the stock and stereotyped phrase "only detailed refinement" was so overworked as it will be at show stands during the next few months. However, there has been a break in the sameness brought about by the settling of designs in well-defined grooves that will give the makers and their salesmen something to talk about, and that is their six-cylinder models. That the six-cylinder car will hold a big place on the floor, so far as popular interest is concerned, there is little or no doubt. It is going to be a notable year for the six-cylinder, all arguments to the contrary notwithstanding.

But whether there will be more sixes sold at the shows than fours is quite another matter. While taking up the new type, very few makers indeed have relinquished old attachments, and their lines will merely be that much more comprehensive. They are all out after some of the six-cylinder business. Whether they stick at it depends upon whether the six-cylinder holds its popularity. Though pretty thoroughly tried out already, it has still to work out its own salvation where the great majority of autoists are concerned.

Speaking of motor design proper, there is not a great deal to record. The superimposed camshaft has gained a recruit or two and the advocates of head placing for the valves have strengthened their position to some extent. Where powers are concerned, motors are larger than ever and smaller than ever, an anomalous statement that is readily explained by the fact that while some have still continued to reach for the upper extreme others have begun to realize that the day of the sane and safe automobile is drawing near and that there will be far more 20-24's sold than 60's, and have planned their lines accordingly.

**Has the Highest Point of Advantage Been Passed?**

It was long ago realized in marine engineering practice that beyond a certain speed every extra knot had to be paid for so dearly as to scarcely make the game worth the candle. Where a 15-knot speed could be obtained at the expenditure of 100 tons of coal a day, it was found that 400 tons of fuel were consumed in the same time to make 20 knots. The same thing is just coming to pass in automobile design, and that fact could hardly be better illustrated than by a comparison which the *Autocar* makes of the sizes and speeds of some of the cars in the more important Continental road races during the past season.

Practically every one of these events was very closely contested, many of the competitors who finished but a short time apart and averaged almost the same speed throughout the race having cars, in some cases, which were equipped with very much larger motors than their competitors. For instance, the winner of the Coupe de Velocité had an engine 1.8 times as large as that of the winning car in the Florio cup, yet the speeds were nothing like that far apart. In another instance, the larger car had an engine that compared with the motor of its competitor in the ratio of 2.2 to 1, yet with such an overwhelming superiority in engine power the average speed of the larger car was but 3-4 mile better than that of its far smaller rival. It only goes to show that racing car motors have been carried far beyond the point where the greatest advantage is to be gained, and greater refinement rather than greater size is what is needed.

WALTER WINS TRENTON EIGHT-HOUR RACE.

TRENTON, N. J., Oct. 5.—Instead of a 24-hour race, the big automobile event at the Inter-State fair was reduced to 12 hours and finally cut down to 8 hours. A Walter, driven by Joe W. Parkin, Jr., with his father acting as his mechanic, evolved as the winner, covering 357 miles. Another Walter, driven by Edwin Walter, was second, with 347 3-4 miles; third was a Franklin, 290 1-4 miles; fourth, a Stearns, 163 miles. A Thomas car, driven by Paul Schill, and a Rolls-Royce, driven by Burns, were other starters.

The race began in the afternoon and concluded at midnight. The wide half-mile track gave plenty of room to the contestants and was fully as safe as the average mile course.

The first few miles of the race were well contested. Immediately the Stearns, Thomas, Bolls-Royce and the Walter, driven by Joe Parkin, shot to the front and trailed one another closely. On the fourth mile an accident happened to the Stearns, which put it out of commission for almost an hour. A bolt in the clutch snapped and the car was sent to the inclosure for repairs.

The most excitement of the early miles of the race was furnished by the Walter car, driven by Joe Parkin, and the Rolls-Royce, and it almost ended in a serious accident. On the twenty-fifth mile the Rolls-Royce made an effort to pass the Walter. For five miles they raced side by side and took the turns dangerously close to one another. On the thirtieth mile the English car assumed the lead, but it was only for a few minutes, as at that point a tire on the front wheel of the Rolls-Royce burst and the car swerved to the side into the fence. The fence was torn down for a short distance, but aside from a torn tire and a few dents there was no damage done. Neither Driver Burns nor his mechanic were injured, and after a delay of twenty-five minutes the car resumed the race.

AERONAUTS PREPARE FOR ST. LOUIS RACE.

Last Monday evening many of the foremost aeronauts of the world assembled at the headquarters of the Aero Club of America, 12 East Forty-second street, New York City, to discuss preliminary arrangements for the International Aeronautic Cup race, which is to start from St. Louis, October 21. Major Hersey, U. S. A., who accompanied Lieut. Frank Lahm on his victory of last year, has obtained permission from the War Department to compete, and will use the balloon *United States*, last year's winner. The balloons *Pommern* and *St. Louis* have arrived at St. Louis from Brussels and Paris, the former being the balloon in which Oscar Erbsloeh won the International Aerial Congress race, September 15.

Among the prominent American aeronauts present were Frank S. Lahm, whose son won the international race last year; Alan R. Hawley and J. C. McCoy, two of the cup defenders this year; Homer W. Hedge, former president of the club; Leo Stevens, J. deMont Thompson, William J. Hammer, Augustus Post, W. R. Kimball, E. B. Bronson, J. C. Lake, Dr. Calvin T. Adams and Charles Jerome Edwards.

PELLETIER TO MANAGE FIRST DETROIT SHOW.

DETROIT, MICH., Oct. 7.—With twenty-five dealers, representing some half hundred standard cars, pledging their support to the undertaking, the Detroit Automobile Dealers' show, scheduled for the week of December 9, is already an assured success. It was decided some time ago by the dealers that they would have an exhibition of their own, independent of what the Tri-State Auto and Sportsmen's Association, under whose auspices previous events of this nature have been held, might decide to do. The expense will be borne proportionately, and the fact that it is up to them to make good furnishes added incentive. The management of the affair has been placed in the hands of E. Leroy Pelletier, one of the best known of Detroit's publicity men, who is already busily engaged in the work.

OLDS AND ATLAS WERE BRESLIN DRAWERS.

At the usual ante-show luncheon, given by the Hotel Breslin to the representatives of exhibitors in the Grand Central Palace and Madison Square Garden shows, held Tuesday at 1 P. M., the lucky winners in the drawing for the privilege of exhibiting cars during show week were Oldsmobile and Atlas.

The A. M. C. M. A. cars figuring in the drawing were the Ford, Berliet, American Mors, Maxwell, Welch, Acme, and Crawford.

The licensed candidates for a week of hotel corridor publicity were the Lozier, Locomobile, Stearns, Haynes, Peerless, Apperson, Hewitt, Pierce, Columbia, and the lucky Oldsmobile, represented by C. H. Larsen. C. H. Martin drew for the Atlas.

Gen. John T. Cutting, Col. K. C. Pardee, H. T. Clinton, Alfred Reeves, E. S. Partridge, C. G. Wridgway, and Harry Caldwell, purveyor of "gasoline gossip" in the *Evening Telegram*, were the speakers, with T. F. Moore as the versatile toastmaster, and G. T. Stockham bidding the guests welcome to the Broadway hostelry, which is always during show weeks one of the headquarters of the trade.

AEROCAR PLANT MAY BE REOPENED.

DETROIT, MICH., Oct. 7.—That A. Y. Malcomson, principal owner and guiding spirit of the Aerocar Company, is still far from down and out is evident from developments in connection with the financial entanglements of that concern. Mr. Malcomson got the plant at the foreclosure sale, and now it is announced that he will shortly reopen it, putting a water-cooled car on the market for the coming season. The plant is admirably adapted for the building of automobiles, having been constructed solely for that purpose, and the concern should once more become an active figure in the trade. It is understood that C. Arthur Benjamin, for some time general manager, will be retained in that capacity.

CHICAGO'S PRACTICAL RELIABILITY RUN.

CHICAGO, Oct. 7.—The Chicago Motor Club has decided to promote a three-day reliability run of 600 miles during the week preceding the opening of the Chicago show. The dates selected are November 26, 27 and 28, respectively, and the contest has been divided into three parts, first day being to South Bend and return, 200 miles; to Milwaukee and back on Wednesday, and to Rockford, Ill., and return, Thursday. There will be three classes: one for cars selling at \$1,500 and under, the second class for cars under \$3,000, and the third for cars over \$3,000. In the matter of sealing the committee proposes to be most strict, but it is not going to do as the New Yorkers did—disqualify a car if a seal is broken. Instead there is a penalty attached.

SHOEMAKER AUTO COMPANY GOES TO ELKHART.

On October 10 the Shoemaker Automobile Company, which since its organization has been located at Freeport, Ill., removed to Elkhart, Ind., where a new factory has been erected. It will be recalled that the first try-out of a Shoemaker car was in the gruelling mud rout of the A. A. A. last summer, in which it acquitted itself remarkably well, while its driver, who is also its designer, was exceedingly game in the face of a string of misfortunes that would have made the average driver turn back long before the tour was half over.

TWO MORE A. M. C. M. A. MEMBERS.

During the past week, the American Motor Car Manufacturers' Association, popularly known as the "independents," added two additional firms to its constantly increasing membership roll. The new members are the Continental Auto Manufacturing Company, New Haven, Conn., and the Brush Runabout Company, Detroit, Mich., the admission of which brings the total membership of the association up to 51 manufacturers of complete cars.

OCTOBER WEATHER STIMULATES CLUB LIFE

CONDITIONS IN CENTRAL MASSACHUSETTS.

WORCESTER, MASS., Oct. 7.—Worcester Automobile Club members, looking over the season which is closing for driving, take satisfaction in the conditions which have prevailed this year, regarding the lack of bother which has been meted out to autoists in Central Massachusetts by the constables and the courts of the section. Club members, who have been members for the past three years, note the diminution of the trap troubles, and feel the action of the club has been one of the means to that end. The vigorous action of the club on this and other lines has had its effect. Leicester, the most prominent of the towns from its location on the main line between New York and Boston, saw no profit in employing men to give the town a bad name among automobilists, with no corresponding remuneration to its treasury, and this year has been off the map as a trouble-maker. The other towns which in a lesser degree had been on the motor blacklist followed suit and there has been little trouble in Worcester county all this season, which is a matter for general congratulation.

The local club has taken action on the line of the Automobile Club of America, and will have a club plate. In fact, the movement began before the members learned of the action of the A. C. A. The club seal is as nearly a replica of the seal of the city of Worcester as is practicable and the "Heart of the Commonwealth" appears in its center or chief, heraldically speaking.

Preparations for the annual banquet of the Worcester club late in November or early in December are being made.

NEW JERSEY CLUB'S ENDURANCE RUN, NOV. 15-16.

NEWARK, N. J., Oct. 8.—The twenty-four-hour endurance contest of the New Jersey Automobile and Motor Club has been set for November 15 and 16, the date having been decided upon at a meeting of the racing committee held last Thursday night, at which time the rules to govern the contest were reviewed. Secretary Bonnell has drawn up the complete regulations and they will be substantially the same as those governing the three-days' contest held last spring. The arrangements have not been perfected as yet, however, and it will be several days before definite announcement is made. The route as outlined in a former issue of THE AUTOMOBILE will probably be followed with few changes, except that the Eagle Rock road may be selected either going or returning. The start will be made at an early hour Friday in order to finish in good season on Saturday. As the fee is only \$10 a large number of entries is expected.

It is understood that the club will seek new quarters further uptown when the year's lease on the building at Broad and Chestnut streets expires. Some of the members are desirous of having the club in the suburbs, but the majority favor a central location and advocate the erection of a special building somewhere in the vicinity of Military Park.

MARYLAND CLUBS COMPLETE A. A. A. BODY.

BALTIMORE, MD., Oct. 7.—The Maryland State Automobile Association of the American Automobile Association was formally organized last week at the first fall executive meeting of the Automobile Club of Maryland. The organization will comprise the following clubs: Automobile Club of Maryland, Baltimore Automobile Club, Baltimore County Motor Club, Hagerstown Auto Club, Allegany Auto Club, and the Motor Car Racing Association.

The following officers were elected for the new association: President, Osborne I. Nellott; vice-president, H. M. Rowe; secretary, F. M. Darling; treasurer, W. S. Belding. The board of directors includes these officers and W. W. Baldwin. At the first semi-monthly meeting State work will be outlined.

KANSAS CITY (MO.) CLUB HAS A PARADE.

KANSAS CITY, Mo., Oct. 7.—The Automobile Club of Kansas City held its first annual parade last Tuesday. Every car in line was gayly decorated and, it being festival week, everybody was smiling and happy. There being no assignments of places in advance, everybody who came went to the end of the line, excepting, of course, the women drivers, who were given the preference and placed near the head of the parade. After going through the downtown business section, the caravan proceeded to Elm Ridge, watched a horse race and an exhibition by a horse, and then the autos became the feature of the fair and circled around the track time and again. The drivers fully enjoyed the idea of going as fast as possible, and several impromptu races took place. One man in a "Lemon," as he calls it, went around so fast that several people in the grandstand saw him both coming and going at the same time. As no watches were held, no records were broken, except verbally. When the time came for



PARADE OF THE AUTOMOBILE CLUB OF KANSAS CITY.

the next horse race, the autos were still speeding over the track at a rapid gait. The judges yelled at the motorists to leave the track, but they took their time and enjoyed a few minutes more at high speed. The crowd gradually dispersed and went home well satisfied with the day's pleasure, voting the parade a success, all promising to be in line again next year.

BOSTONIANS TO HOLD GYMKHANA THIS WEEK.

BOSTON, Oct. 7.—The Bay State Automobile Association will hold its second annual gymkhana games at the Newton Athletic Grounds, in Newton, Mass., next Saturday, October 12. Secretary James Fortescue has been actively engaged in making preparations for the affair for some time past. The list of events will include many of the familiar "stunts" that go to make up an occasion of this kind, together with a number of original ones which should prove amusing as well as interesting, as they are designed to test the skill of the drivers, besides displaying the stability and flexibility of the cars themselves.

MINNESOTA AUTOISTS TO STOP THEFTS.

MINNEAPOLIS, MINN., Oct. 5.—Owing to the large number of automobile thefts that have been committed in the Twin Cities of late, the Minneapolis Automobile Club has decided to prosecute every one caught taking an automobile, whether in fun or for the purpose of realizing on the theft. In order to catch these thieves the club has engaged permanently the services of a detective, who will be on hand at the clubrooms all the time.

and will go out on a chase after lost automobiles at a moment's notice. The chief of police has promised to co-operate.

Arrangements have been perfected by the Twin City automobile clubs for trip to Duluth about the 20th of October. Twenty-five entries have already been made. Duluth is a popular Mecca for automobile tourists, although the roads leading there are not all that could be desired. The State Automobile Association has taken the matter up and is raising funds to perfect the highway, the opposition, curiously enough, coming from farmers along the proposed route. They are, however, being shown the advantages, and the tide of illfavor is being turned.

The State Automobile Association of Minnesota has just issued a touring book, compiled by George H. Daggett, chairman of the tours committee. The book gives elaborate details as to the various routes radiating from the Twin Cities. Twenty maps locate the main highways and cross roads.

BUFFALO CLUB CELEBRATES THIRD SUCCESS.

BUFFALO, N. Y., Oct. 7.—The Automobile Club of Buffalo last Thursday night celebrated its third consecutive success in the annual A. A. A. tour, its 1907 Glidden trophy team being the guests of honor. Drivers Salzmann and Richards, of the Thomas; Dey and Kumpf, of the Pierce, and Gus G. Buse, Jr., the Packard pilot, were the heroes of the occasion. President William H. Hotchkiss, of the A. A. A., was one of the speakers, and he reiterated his ideas on track racing, commended the Connecticut law, and condemned the statute in New Jersey. E. R. Thomas,

chairman of the Western New York Roads Improvement Association, said that a good road from Buffalo to Niagara Falls is to be a realization of the near future. Incidentally, Mr. Thomas said that he intended to issue instructions to all the Thomas agents asking them not to enter cars in track competitions under present conditions.

RHODE ISLAND CLUB ACTIVE IN SIGN POSTING.

PROVIDENCE, R. I., Oct. 7.—As the start of its projected road posting campaign, the Rhode Island Automobile Club of Providence will shortly commence the work of marking the road between this city and Narragansett Pier, posting all turns and dangerous places. The signs will be a departure from ordinary usage in that they will be only three feet high and will be placed near the edge of the road so as to be illuminated by the car's headlights. Later the club will erect sign posts on all the suitable touring roads of the State.

ROCHESTER CLUB'S HILL-CLIMB OCTOBER 12.

ROCHESTER, N. Y., Oct. 7.—The Rochester Automobile Club will hold its annual hill climb, Saturday, October 12, at the Penfield Dugway. The early date was decided upon because of the automobile show to be held in New York later in the month. There will be twelve events, open only to members of the club, with the exception of two free-for-alls, which will be open to members of any club or of the A. A. A. Entry blanks are now ready. The entrance fee will be \$2.

BOSTON'S ANNUAL FALL AUTO TRADE CHANGES

BOSTON, Oct. 7.—Boston's automobile trade is just now undergoing the usual fall reorganization. The movement from the older automobile section in the vicinity of Columbus avenue toward the newer section on Boylston street and Massachusetts avenue is very pronounced this season, and already several firms are opening new Quarters on Boylston street. The completion of the Copley Square garage has also brought about some changes, two or three firms having taken quarters there for sales or garage purposes. Among these are the Dodge Motor Vehicle Company, distributors of the Pope cars, and the Butler Motor Car Company, which sells the Cleveland, Pierce-Racine and the Rapid. The Stranahan-Eldridge Company, agents for the Buick, has also taken space in the Copley Square garage and is about opening a salesroom on Boylston street near the Massachusetts Automobile Club.

Another newcomer on Boylston street and also in Boston is the J. W. Bowman Company, agent for the Stevens-Duryea cars, which also has garage space in the Copley Square garage. Mr. Bowman was formerly of New York. For many years the Stevens-Duryea has been handled in Boston by F. E. Randall, and after his death last spring the agency was conducted by his widow. It has now been transferred to the Bowman company and the Randall estate will have the Pennsylvania, with a salesroom on Columbus avenue and a large garage on Stanhope street. Another shift in agencies in the Boylston street section is the transfer of the Premier from George C. Squier to H. L. Johnson, who comes here from the factory. He has a salesroom at 1008 Boylston street.

It is understood that a change in the A. E. Morrison Company, agents for the Oldsmobile and the Stearns, will shortly be announced. Arthur Adams, who had charge of the Oldsmobile sales, has the agency for the Oldsmobile the coming season, and it is said that he will organize a new company for the handling of the Oldsmobile exclusively. Whether the Morrison company will continue with the Stearns is not settled. Mr. Morrison has been under the weather all summer on account of an injury at Lowell on July 4, while engaging in a road race, and has not yet announced his plans. No changes have yet been announced at the Henshaw Company, agents for the Haynes; the Matheson Company of Boston, the Locomobile branch, of which K. M. Blake is manager; the Dragon branch, the Lozier agency held by H. C. & C. D. Castle, the Shawmut branch; the Columbia branch, of which J. H. MacAlman is manager; the Winton, Peerless, Ford, and Franklin branches.

The White Company has just opened a new garage on Newbury street, which will be conducted in connection with the White branch nearby under the management of J. S. Hathaway. The J. W. Maguire Company, agents for the Pierce, has also expanded, tak-

ing in the adjoining store on Boylston street formerly occupied by the Napier Company. Alvan T. Fuller, agent for the Packard and the Cadillac, has increased his salesrooms by leasing the apartment on the Columbus avenue side of the Motor Mart formerly occupied by the Apperson agency. The Apperson agency has been transferred to F. S. Smith, of Columbus avenue, who has handled the Autocar and Walter. The Maxwell-Briscoe Boston company is expected to remain in the same location on Massachusetts avenue, and the Bay State Company will continue to manufacture the Bay State Forty on Norway street. A. R. Bangs, who manufactures the Viking, has removed from Boylston street to his factory on Stanhope street. The Curtis-Hawkins Company, of the Motor Mart, which formerly was the agent for the Grout, has taken on the Chadwick for 1908.

There is some uncertainty about the Thomas agency in Boston. It is said that the Harry Fosdick Company, which has handled it recently, will have something else for the coming season, and it has been reported that C. E. Whitten, of Lynn, is to be the Thomas representative. Since Mr. Whitten made his announcement, however, there have been reports to the effect that the matter was not definitely settled. W. M. Jenkins & Co., of Columbus avenue, are to handle the Mitchell, and the Metropolitan Automobile Company, of Stanhope street, will have the Moon another year. H. C. Stratton Company, which last spring located on Huntington avenue, has added the Queen to its list of agencies, now representing the American Mercedes, Car de Luxe, Kissel Kar, and the Queen.

V. A. Charles assumed the management of the Rambler branch this summer, succeeding Clarence Glimore, who went first to the Knox and then to the White Company, and beyond a few changes in personnel the Rambler branch remains the same as in former years, being located on Columbus avenue. The Corbin agency remains in the Motor Mart under the name of the Corbin Motor Car Company, formerly the E. T. Kimball Company, and the Northern Automobile Agency, of the Motor Mart, formerly representing the Pullman and Pennsylvania, now has the Pullman only. The Frayer-Miller agency, formerly held by D. P. Nichols & Co., has given up its Motor Mart salesroom. The George H. Lowe Co., agent for the Aero-car and American Mors, has not made known its plans for 1908, and the same may be said of the St. Louis agency on Boylston street. Bond Bros., agents for the Deere, the Dolson agency, Darracq, and some other cars.

It is too early yet for the announcement of agencies for new cars, but there is every reason to believe that after the New York shows nearly every car manufactured in the United States and most of the prominent foreign machines will have representatives in Boston.

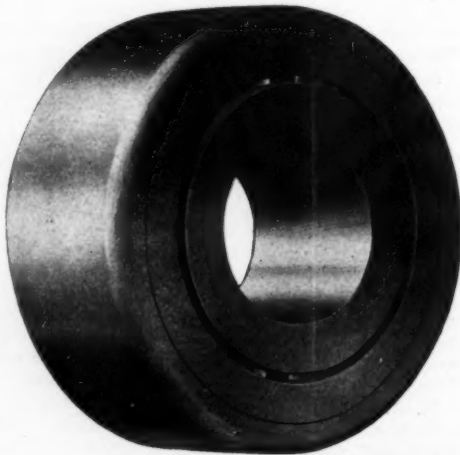
NEW COMBINED THRUST AND RADIAL BEARING.

Albert F. Rockwell, president of the New Departure Manufacturing Company, Bristol, Conn., is the inventor of a new type of ball-bearing which will be publicly shown for the first time at the coming show in Madison Square Garden next month. It differs radically from current types in that two rows of balls and two sets of ball races are utilized, thus making the bearing capable of taking a thrust as well as a radial load. It is de-



PART SECTIONAL VIEW.

signed to take the place of the combined end thrust and radial load bearings at present in current use on automobiles, the load being equally distributed on the two rows of balls by means of a special form of separator, which is shown by the illustration picturing a bearing of this new type with the races partly broken away to reveal the interior. By this means the load is taken on a diagonal line from the vertical instead of radially and in such places as a bevel-gear driving unit, where the line of pressure is at right angles to the base of the teeth of the pinion, the load is intermediate between the radial and end pressure and is taken care of to the best possible advantage. The separator is designed to permit the use of the greatest number of balls possible, and is supported by the two rows of balls. The latter are of the company's own manufacture and have been used successfully for years in New Departure bicycle and motorcycle coaster hubs. The chief advantages claimed are the greater load carrying capacity of the new bearing due to the use of two rows of balls instead of one, and the possibility of employing a correspondingly smaller size of bearing to perform the same service. The results of some remarkable tests will be displayed in connection with the exhibit at the show.



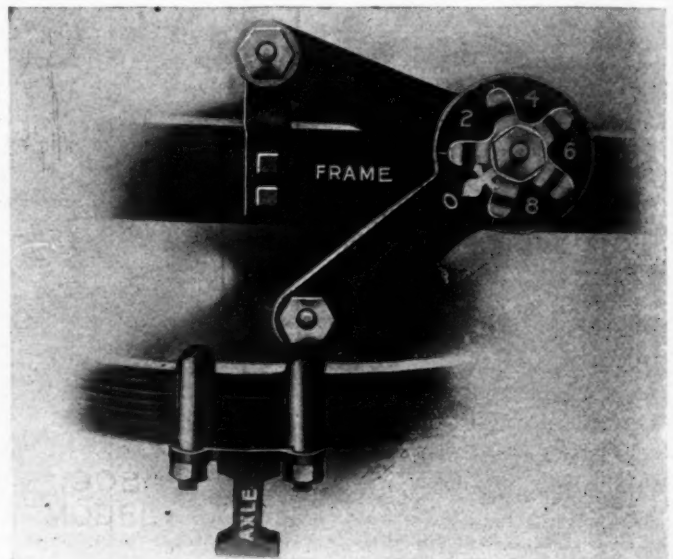
NEW RADIAL AND THRUST BEARING COMPLETE.

A large addition to the company's plant at Bristol, Conn., is now nearing completion and will be devoted entirely to the manufacture of the new bearings, which will be exploited not alone for automobile construction, but for many other uses as well. Several makers of automobiles have already tested out the New Departure bearings on their cars during the past season and will make them a feature of the construction of the 1908 models. In addition, exhaustive tests of the new bearings have been made in the home factory and they have shown up so well under them that the company will operate the new addition to the plant to its full capacity from the start.

TRUFFAULT-HARTFORD SHOCK ABSORBERS.

Though highly efficient in other respects, it has been found difficult when using shock absorbers to set each one of the four, or each pair, front and rear, to work together; that is, so that each one would oppose the same amount of frictional resistance as the others, and this is a fault that the makers of the Truffault-Hartford shock absorbers have eliminated in the 1908 model of that device, by unique means. An indicating arrow and dial have been provided, the latter with a scale calibrated so as to show just how the absorber should be set for different weights, ranging from 1,600 to 5,500 pounds. The ends of the arms have also been simplified, thus making the application of the shock absorbers much easier.

With the exception of the friction disks, the device is constructed of crucible steel and brass throughout, and consists of three arms of equal dimensions, two paired, and the third acting as a middle arm, all three being joined by a center stud, making the shock absorber interchangeable and reversible. The center, or middle arm, works on a hardened steel bushing giving a



1908 MODEL OF THE TRUFFAULT-HARTFORD SHOCK ABSORBER.

straight up and down movement which prevents shearing and side swaying. The inner surfaces of the lower or outside arms come in direct contact with cup-shaped brass disks, firmly secured, instead of friction washers as heretofore, while on each side of the center arm the friction disks themselves are attached. Over them is fitted a brass cup into which the friction and brass disks telescope, making the new construction dirt and waterproof. The same special frictional material which was found to give such excellent service in the 1907 model has been retained. Its construction is such that it lubricates itself automatically in proportion to the pressure, the surfaces containing sufficient lubricant to last the life of a car. The fact that no less than seventeen different American manufacturers now use the Truffault-Hartford as part of the regular equipment of their cars speaks for itself.

CHARLEY SEVERS RELATIONS WITH MERCEDES.

C. L. Charley, who has been associated with the selling end of the Mercedes company ever since the latter began to market its cars outside of Germany, has just severed his contract relations with that firm, although he has let it be known that he will continue to assist those of his sub-agents who still have chassis to dispose of under existing contracts. M. Charley was the sole distributor of Mercedes cars in France, England and the United States, and, as such, came to be known almost as well on this side of the Atlantic as abroad.

PERFECTED DRY CELL IGNITION ON ELMORE.

As an inkling of one of the things they will uncover at the coming Garden Show, the makers of the Elmore two-cycle cars state they have been making an exhaustive line of experiments with dry cells as a source of ignition current, and what is far more to the point, that their experiments have been remarkably successful. For instance, they are willing to guarantee that with their improved system of ignition using dry cells, an Elmore will run 1,500 miles without replacing them, and they have on record an instance of 2,000 miles having been covered. This means that an average season's driving can be accomplished on two sets, or a dozen six-inch dry cells, with which every Elmore is equipped. More than that, the system is said to be so sensitive that it has worked successfully for several hours on dry cells that had been discarded as worthless by other users; in fact, it has continued to operate until the cells would not give a reading in excess of one ampere.

REGARDING THE PARKWAY GARAGE COMPANY.

According to newspaper reports that appeared last week, the Central Park Automobile Storage Company filed a list of its assets and liabilities in conformity with the bankruptcy laws, its petition having been filed and a receiver appointed in November, 1906. The receiver decided not to carry on the business and the premises at Central Park West and 110th street were accordingly leased to the Parkway Garage Company, which was involved. The only connection between the latter company and the bankrupt concern, however, is that the Parkway Garage Company is the present occupant of the former company's location. C. Herbert Covell, who is also president of the Covell & Crosby Motor Company; Richard K. Fenker, formerly general manager of the same concern, and Leslie B. Sanders, manager of the automobile department of the Fiss, Doerr & Carroll Horse Company, comprise the Parkway Garage Company.

TRADE NEWS FROM THE QUAKER CITY.

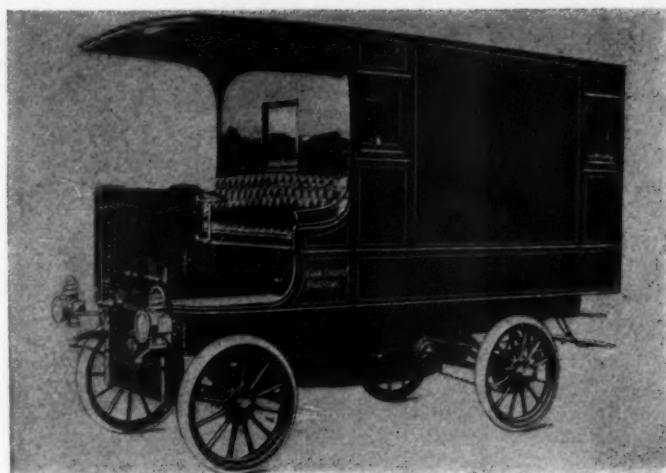
PHILADELPHIA, Oct. 7.—Manager W. F. Smith, of the local branch of Thos. B. Jeffery & Co., makes the announcement that the Rambler concern has again been compelled to seek additional room to carry on the business. With no less than three local establishments, a lease was signed last week whereby the large factory building at Broad and Washington avenue was turned over to Manager Smith. It is the intention of Mr. Jeffery, who came on to engineer the deal, to establish the largest and best equipped garage and repair shop in the country.

The Charles F. Johnson Automobile Company, which recently took over the local agency for the Pope-Toledo car, has engaged J. B. Dickson to manage the Broad street establishment it is about to close negotiations for.

An agency is to be established here shortly by the Imperial Motor Car Company, of Williamsport, Pa., makers of the Imperial cars.

AN ADDITION TO LIST OF WESTERN MAKERS.

ROCKFORD, ILL., Oct. 7.—With the incorporation of the Rockford Automobile and Engine Company in this city, Illinois is to have another automobile manufacturing concern within its borders. The new company is backed by Adam Ziska, Jr., John F. Waters and A. G. Parmele, who figure as its incorporators, the capital stock being placed at \$50,000. John F. Waters was formerly at the head of the Federal Automobile Company in Chicago, and came here a few weeks ago seeking capital to build a car which he has perfected. The type is that of the familiar buggyabout, with solid tires, the engine being placed beneath the body horizontally, and it is said to have proved very successful. It will be known as the "Rockford," will have an 8-10-horsepower motor and friction transmission.



AMBULANCE MADE BY THE RAPID MOTOR VEHICLE COMPANY.

LATEST GASOLINE-DRIVEN AMBULANCE.

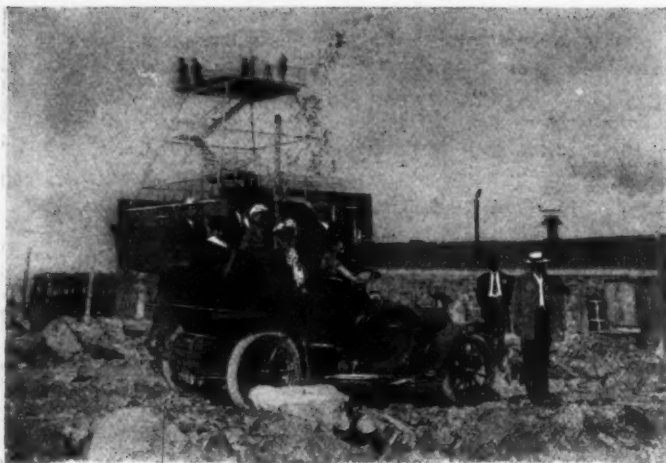
While its line of commercial gasoline-driven vehicles has heretofore included almost every known type for business purposes, the Rapid Motor Vehicle Company, Pontiac, Mich., has recently branched out still further and are now marketing a gasoline-driven ambulance. The motor-driven ambulance has long been a familiar sight, but up to the present electric cars have been used almost exclusively. The chief feature of this new ambulance, a view of which is shown by the photograph, is its greatly increased accommodation over previous types. Entrance is by two broad steps in the rear, leading to two full-size emergency cots with an aisle between. Seats are provided for three attendants, one in the center of the aisle and one at the foot of each cot, while the driver's seat, upholstered in tufted leather, is 4 feet 6 inches wide and easily accommodates three persons.

HARTFORD TO HAVE A HIGH-SPEED PATROL.

What is probably one of the most advanced types of patrol wagons ever built for American municipal service has recently been turned over to the city of Hartford by the Pope Manufacturing Company. It is built on a Pope-Hartford chassis, the mechanism of which does not differ from the standard car of that type, and is equipped with a specially designed body which will comfortably seat eight persons, or ten at a pinch, in addition to the driver. One of the most valuable features of the body design is the fact that it has been made so as to be readily convertible for ambulance purposes by the removal of the benches. The tire equipment consists of five-inch Hartfords on Midgley rims, and the car is capable of making forty miles an hour.



HARTFORD'S NEW POPE-HARTFORD POLICE PATROL.



MR. HOLLINGSHEAD'S STEARNS ON PIKE'S PEAK SUMMIT.

TO THE SUMMIT OF ZEBULON PIKE'S PEAK.

J. D. Hollingshead of Chicago, touring through the western part of the country, recently decided to attempt the ascent of the famous peak bearing Zebulon Pike's name. Start from Manitou was made with F. W. Leland at the wheel of the Stearns. It was feared at first that because of the rapid change in altitude much carburetor trouble would develop, as the top of the peak is 14,147 feet high. The occupants of the car were agreeably surprised, however, for not once was the slightest trouble encountered. The details of the climb are best told in the words of Leland: "I never met such awful roads in my life, or, to be more exact, I never before traveled on such ground without any road. At first it was all right. In fact, we were able to find the road all right as far as the Half-Way House, but from there on we were forced to run along the trail used by horses and burros in climbing the peak.

"But the worst of all was making the turns. Owing to the character of the road (?), it was necessary to back up a trifle and then go ahead, and it was very ticklish business. Meanwhile the grade was becoming something frightful, but we plugged right along. Then we came to one place that almost made the women of the party faint. It was necessary to back up a little, and as we rounded the corner, going backwards, we almost dropped over a precipice. I slammed the emergency on quick, reversed her, and opened the throttle. She picked up quickly and pulled us off the edge. After that we were mighty careful how we backed up.

"When we were about seven hundred feet of the summit the

little 'T' rail ceased entirely, and after that we simply had to force our way up over the rough rocks. The car rocked from side to side continually, but she never faltered, and in a short while we had reached the summit, the first touring car ever to make the ascent and the only machine which ever turned the trick unaided."

BANQUET TO THE RED CLOUD "OLDSMOBILERS."

AKRON, O., Oct. 7.—Fred W. Work and C. J. Maxon, who arrived home Friday from their double transcontinental trip in an Oldsmobile, were given a banquet and reception at the Country Club Friday night, when over 50 local autoists were present. The banqueters included Tom Ralph Owen, whom Work accompanied on the New York-Florida tour of January last. Work and Maxon told of their exciting experiences on the trip, including some amusing episodes. R. E. Owen also spoke briefly of his record trip last spring from San Francisco to Los Angeles.

"Red Cloud," the Oldsmobile with which the trip from Akron to San Francisco and back through the Southwest and South to New York and return to Akron was made, has been placed on exhibition at the garage of the Akron Automobile Garage Company, and will probably be shown at the New York Automobile show. It is just as it appeared when it arrived, with the entire equipment, including revolvers, block and tackle, tools, maps, etc., and their condition shows that their presence on the car was not purely ornamental during a large part of the trip through the far West.

THE ANNUAL FORD FAMILY REUNION.

Four pleasant days were passed by branch managers and heads of departments of the Ford Motor Company in the annual "Ford Family Reunion" at Detroit last week. There were some intervals for serious business talks, but the greater part of the time was spent in sampling the good things provided. An interesting trip was made to Pine Lake, thirty miles from Detroit, where a sumptuous banquet was served at the Automobile Club house. Wise and witty speeches were delivered by Messrs. Couzens, Hedges, Hawkins, Plantiff, Wills, Flanders, Walburn, Pelletier, Fay and other members of the organization. Congratulations went the round for the large cash volume of business done during the past twelve months—over \$7,500,000—and the record output of Ford cars. As guests of the Dodge Brothers the party enjoyed a hair-raising ride on the *Hornet*, the fastest launch on the Great Lakes, and on Saturday, at the State Fair grounds, watched Henry Ford do some fast miles on his latest speed creation. Mr. Ford drove the car himself for three miles, the last in 59 seconds, and Kudlik did three, each in 55 flat, which roused the enthusiasm of the crowd to a high pitch.



FORD BRANCH MANAGERS ENJOYING AN OUTING AT PINE LAKE, NEAR DETROIT, DURING THE ANNUAL REUNION AT THE FACTORY.



THE RECENTLY COMPLETED BARCLAY GARAGE AT MINNEAPOLIS.

Minnesota's Metropolis Has a New \$60,000 Garage.

MINNEAPOLIS, MINN., Oct. 4.—In the completion of the J. J. Barclay garage, Hennepin avenue and Harmon place, Minneapolis finds herself in possession of the most modern and completely equipped automobile shop west of Chicago. The building has two stories and a basement. It is constructed of white sand lime brick, concrete and iron, being not only substantial but handsome in appearance. The basement is used for the heating plant, for the charging of electric vehicles and for dead storage. It also contains a work bench for the free use of private chauffeurs. The first floor is for the offices and garage and the second for the workshop, the stock and tool room, the chauffeurs' room, the paint room, the dust-proof varnish room and salesroom.

One of the features of the new building is the workshop. This has seventeen windows and a large skylight. The work benches are of the latest design. The three pits are well lighted and ventilated from below. The dust-proof varnish room is another triumph in up-to-date garage construction, and also the chauffeurs' rest room. A 10-horsepower electric elevator runs from the basement to the top floor.

Previous to 1902 Mr. Barclay was in the land business. Seeing a good future for the automobile business, he established himself in a small shop with a floor space of less than 2,000 feet. His new garage has a floor space of 28,089 square feet. The cost of the new structure completed is \$60,000.

Another Link in the New York-Buffalo Chain.

AMSTERDAM, N. Y., Oct. 7.—It is evident that in the course of a few years the entire length of the route from New York City to Buffalo will be lined with modern garages at all the more important stopping points. The latest to be completed is that of William Daye, whose business outgrew the old quarters on Division street, and who has since had constructed for him a modern building on the east side of Walnut street, adjoining the Hotel Warner. The new structure has a frontage of 54 feet on Walnut street and is 108 feet deep. It is of brick and steel construction with a main floor of concrete, and is accordingly fireproof. On the second floor will be located a completely equipped machine and paint shop, which will be in charge of R. G. Daye, an expert machinist, lately with the General Electric Company. A large electric elevator is provided to carry the cars to the upper floor.

Springfield Boasts New England's Most Modern Garage.

SPRINGFIELD, MASS., Oct. 7.—In the establishment of the Geisel Automobile Company in this city is to be found one of the most representative and up-to-date automobile stations that New England can boast. The building itself measures 56 by 126 feet and is constructed with a trussed roof so that the floor is entirely free from obstructions. On the east side, windows are

placed between each pair of trusses and run up to the roof, giving an unusually liberal provision for lighting. Ease of entrance and exit have also been provided for by making the front door 14 feet wide, while a second door in the southeast corner is 16 feet wide. The washstand occupies a space 18 by 24 feet and is fitted with a special overhead washer capable of swinging round the longest cars. On each side of the garage floor there have been placed seven drop lights on 25-foot cords to facilitate the inspection of cars on any part of the floor. Plans are under way for the addition of an L-shaped wing to measure 50 by 90 feet, which will be used to accommodate a repair shop, and the latter will also be fitted in the most up-to-date manner. The garage is very favorably situated in the center of Springfield's business district and within a block of the railroad station.

Chicago Has Model Garage at Garfield Park.

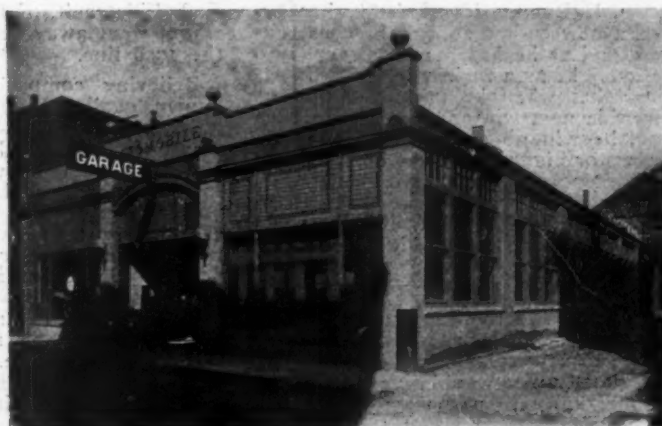
CHICAGO, Oct. 7.—Though out in the suburban districts, the new Garfield Park garage at 435-437 Douglas boulevard can hold its own with anything Chicago has to offer in the way of automobile accommodation. The building measures 40 by 135 feet, facing the park part of Douglas boulevard from the west, and was planned throughout by Herman E. Halbert, its present manager, who is a graduate of bicycling days. It is a fire-proof structure and has storage capacity for forty cars; it is equipped throughout with every modern convenience, including a ladies' waiting room, steel lockers for chauffeurs and owners, overhead washers and a completely fitted machine shop for repair work. Prior to erecting the new building, Mr. Halbert was in business at 1891 Harrison street and is agent for the Cleveland cars, besides maintaining a Prest-O-Lite exchange station.

An Addition to the Metropolitan Garage List.

NEW YORK, Oct. 8.—Another chapter in the usurpation of the place long held by the horse took place in the recent transformation of the well-known Harriman stable building that sheltered some of the Speedway's most famous trotters into the Speedway Garage. It is located just at the head of the Speedway on 155th street, near St. Nicholas avenue. Every modern facility for storage and repair work has been installed, in addition to which a full line of supplies is carried and a renting business will be established. The place is under the management of experienced automobile men and should become deservedly popular.

Capitol Hill Garage in Larger Quarters.

WASHINGTON, D. C., Oct. 7.—James J. Flynn, proprietor of the Capitol Hill Garage, has leased the building formerly occupied by John R. Thomas, at 1028 Connecticut avenue, and has equipped it as the "Mitchell Garage," naming it after the Mitchell cars, for which he is agent in Washington. An electric charging plant has been installed and a line of accessories added.



GEISEL AUTOMOBILE COMPANY'S GARAGE AT SPRINGFIELD, MASS.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Using the assessment rolls as the source of information, it is learned that the number of automobiles in Minnesota has increased from 1,575 to 2,215 in the past year, while their value has jumped from \$697,708 to \$1,009,735.

R. M. Owen & Company, general sales agents of the Reo and Premier lines, are now established in their new headquarters at 1759 Broadway, having lately given up the old place at 40 West Sixtieth street, which had been outgrown some time ago.

It is of interest to note that in the recent twenty-four-hour race held at Morris Park no less than six of the competitors in the race itself used Vacuum oils for lubrication as well as the winner of the cross-country run. These were the Dietrich, the Allan-Kingston, Packard, Itala, Motobloc and Matheson, the other being the American Mors, driven by Owen.

John Wilkinson, chief engineer of the H. H. Franklin Manufacturing Company, Syracuse, N. Y., has just completed a motor that will run on water, though the feat may not be as wonderful at it appears at first sight, as he has merely taken a 1908 Franklin six-cylinder air-cooled engine and put it into a boat that is now the terror of all Skaneateles Lake, as it has greatly surpassed his expectations in speed.

Getting tired of being constantly passed on the road by automobiles, the Fire Department of Long Beach, Cal., decided to do likewise, and accordingly undertook exhaustive tests of different cars. A Rambler, Model 21, was purchased and fitted with chemical fire extinguishing apparatus. After some months' use of this car the town has now placed an order for two Model 25 Ramblers, which will be specially equipped for this service.

The Pittsburg Chronicle-Telegraph has just concluded a unique contest by awarding to David E. Martin, an employee of Banker Brothers Company, of Pittsburg, a valuable prize for the best list of answers to sixty-eight questions regarding automobiles and the handling of them. The queries have appeared in that paper during the past few weeks, and out of the total number Mr. Martin answered sixty-two of them correctly, in the judgment of the committee of award.

John J. Ryan, of turf fame, has ordered a new 90-horsepower Stearns runabout, and as he has recently come into the limelight as a racing driver, it is expected that when he takes the Stearns to Florida next winter, which he intends doing, he will go against everything in his class or bigger. He has been driving a 60-horsepower Stearns with great success, particularly at the recent races in Cincinnati, and has accordingly placed his order for one of the higher-powered 1908 models.

In the opinion of Charles Clifton, of the George N. Pierce Company, the postponement of the stripped stock touring car race to next spring was a wise move, as the short notice would give the makers no opportunity to prepare for the contest. Although the Pierce Company confines its attention to touring and similar contests, it is not improbable that it may

be induced to enter the field with other stock cars in the near future, provided the events be run under the auspices of the American Automobile Association.

John D. Rockefeller displays the same painstaking care and unerring business judgment in the purchase of such a small thing—to him—as an automobile as he does in his vast commercial dealings. He became the owner of a White Steamer limousine in the fall of 1905 and has used the car more or less continuously ever since, but when it came to buying another car of the same make he asked the salesman all kinds of questions, examined the car inside and out, and had a 30-mile demonstration before ordering.

At the forthcoming automobile shows the N. Y. & N. J. Lubricant Company will have a practical demonstration at its booth of a transmission gear lubricated with its KOO-Special Grade non-fluid oil. Another interesting feature of the exhibit will be the presence of Miss Hebe White. Miss White, who has just completed an endurance run against Miss Phoebe Snow to see who could keep clean the longer, will distribute an attractively printed booklet, describing a most interesting cross-country automobile steeplechase.

At the start of their 5,000-mile trip in the six-cylinder Berliet, Arthur N. Jervis and F. M. Hoblitt earned for themselves the title of the "Vanadium Brothers, the Anti-Fatigue Team," due to their acquisition of twin outfits of leather and khaki as a preliminary. Their fame spread abroad, and when they reached Chicago a vaudeville manager endeavored to make a contract with them to do a "turn" in his house. He was informed that their act was "a mile-a-minute knockabout specialty, and a stage a thousand miles square was necessary to play it," which made him conclude he did not want it.

Rambler dealers from all over the continent have been flocking to Kenosha, Wis., the birthplace of all the Ramblers, during the past few weeks. It has long been the policy of the company to encourage an annual visit to the factory on the part of its representatives in order that they may become familiar with 1908 models early in the season. Among recent visitors were W. K. Cowan, of Los Angeles, and F. B. Naylor, of San Diego, Cal.; F. D. Homan, of New York; Prince Wells, of Louisville, Ky., and E. J. Filiatrault, of Duluth, Minn., all of whom went away deeply impressed with the 1908 line.

Believing comparison with a car of known quality to be the only way of judging a new one, the testing department of Thos. B. Jeffery & Son have undertaken a unique form of trying-out for their new models. A 1907 40-horsepower Rambler and a 1908 model rated at 32 horsepower have been assigned to two of the Rambler factory's most expert testers. They are now touring the sand roads and hills of Illinois and Wisconsin and will include some of the better known hills in their itinerary, such as that at Algonquin. In order to stimulate effort, a substantial prize has been offered for the winning man in the greatest number of tests, and in order to equalize matters the operators change cars every morning.

S. B. Green, proprietor of the Central Automobile Garage, Daytona, Fla., is now occupying the new building directly north of his present establishment on Magnolia avenue, on which construction was started about the middle of August. The building measures 33x50 feet, has a concrete floor and metal roof, and will be used exclusively as a machine and repair shop for automobile and boat work. It has been equipped with a complete set of machine tools for this work, and the electric lighting plant in the old building will also be moved.

The directors of the Peerless Motor Car Company met at Cleveland on September 30 and declared the usual annual cash dividend of 10 per cent. The company has been making extensive improvements and additions to its plant during the past year and regards the outlook for the coming season as extremely satisfactory. Among the buildings now in course of construction are a foundry to make aluminum and brass castings for the entire output, as well as to afford facilities for engine and chassis testing, while a second is to form an extension of the present machine shop. New factory offices and draughting rooms are also in course of construction, while considerable special machinery is already being installed.

NEW AGENCIES ESTABLISHED.

Thomas J. Fay, chief engineer for J. M. Ellsworth, 518-520 West Twenty-second street, New York, recently closed a contract with Messrs. Derihon, of Liege, Belgium, through which Mr. Ellsworth becomes sole American distributor of the alloy steel die forgings made by the Liege plant, American receipts of which will exceed \$500,000 in value annually. This factory uses the special automobile steel made by Felix Bishoff, Duisberg, Rhine, Germany. This is one of the largest projects of its kind the year has brought forth, but further developments are expected.

"Western dealers are looking forward to a record-breaking business next year," said Horace De Lisser, president of the Ajax-Grieb Rubber Company, on his return from the West. While away Mr. De Lisser made a coast to coast trip and as a result there are now four branches handling Ajax tires on the Pacific Coast. In San Francisco Hughson & Merten will have charge as managers, and through them special branches will be run in Los Angeles, Portland, Ore., and Oakland, Cal. Charles Davis, former manager for the G & J Tire Company, will travel the Western States in the interests of this concern. A branch was also opened in Seattle, Wash., and placed in charge of Harold W. Stimpson.

The Pennsylvania Auto-Motor Company, Bryn Mawr, Pa., have arranged for agencies as follows for the season of 1908: City Hall Automobile Company, 66 Fulton street, San Francisco; Greer-Robbins Company, 1501-1505 South Main street, Los Angeles, Cal.; Denver Omnibus & Cab Company, Denver, Col.; Hamilton Automobile Company, 1251 Michigan avenue, Chicago; Frederick E. Randall Company, 245 Columbus avenue, Boston; Pennsylvania Motor Car Com-

pany, Providence; Bellefield Motor Company, 4514-16-18 Henry street, Pittsburgh; Robert D. Jones, 409 New England building, Kansas City, Mo.; Rice's Garage, Madison street and North avenue, Baltimore; West-Stillman Motor Car Company, 153 N. Broad street, Philadelphia; Chas. F. Batt, 1378 Bedford avenue, Brooklyn, N. Y.

W. S. M. Mead, manager of the eastern sales agencies of the Lozier Motor Company, has been making a round of the eastern territory, making arrangements for the Lozier representation during 1908. As a result of his trip, H. C. & D. C. Castle, Inc., Boston, will continue to represent the Lozier interests during the coming year throughout the State of Massachusetts, with headquarters at Boston, and a branch at Springfield. In Pittsburgh, where the Lozier has not been regularly represented heretofore, D. P. Collins & Company have taken on the line and will handle it in connection with the Columbia, for which they are agents. The Eastern Automobile Company, Philadelphia, formerly agents for the Lozier and the Stevens-Duryea, discontinued business on October 1, and the Lozier will henceforth be represented in the Quaker City by the General Motor Car Company, who also handle the Autocar.

PERSONAL TRADE MENTION.

David H. Keaghey has just assumed charge of the Allegheny Automobile Company's establishment, Pittsburg, as manager. The concern will handle the Austin, Glide and Rapid trucks.

F. H. Fowler, well known throughout the New England trade, has accepted a position as special traveling representative of the R. H. Smith Mfg Co., Springfield, Mass., makers of the Springfield Motometer.

James F. Fairman has recently joined the selling forces of the N. Y. & N. J. Lubricant Company, 14 Church street, New York City, and will travel in the latter's interests, making his headquarters at the New York office.

Gaston R. Rheims, head of the C. G. V. Import Company, has returned to New York after a two months' stay in France. Before sailing on the return trip Mr. Rheims tried out the first of the new 100-horsepower C. G. V. semi-racers.

Berne Nadall, who until recently was engaged in launching the Comet Motor Car Company, Ltd., of Montreal, Can., is shortly to leave the Dominion and return to the States. He has acquired the American rights of the Gillett-Lehman controller and economizer, and will manufacture and market it in this country. Mr. Nadall will make Chicago his headquarters.

O. H. Henderson, who has been connected with the Waverley department of the Pope Motor Car Company, Indianapolis, Ind., for the past six years, until recently as superintendent of agencies, has resigned, and, while no announcement has been made, it is understood he has already become identified with one of the country's large makers of electric vehicles in a similar capacity.

James Couzens, secretary-treasurer of the Ford Motor Company, Detroit, left for the Pacific Coast on Monday of last week. Mr. Couzens goes to make his annual inspection trip of Coast condi-

tions and to plan his sales campaign in that part of the country for 1908. He is accompanied by Mrs. Couzens and will remain away from the factory about a month, during which time he will visit every city of importance in the West.

F. A. Brodhead, formerly manager and secretary of the American Automobile Company, of Atlantic City, has left the latter concern to assume the management of the Philadelphia store of the Dragon Automobile Company, of that city, becoming resident manager of the Broad street branch. Mr. Brodhead has fifteen years' experience in the selling of gas engines and automobiles behind him and is considered a valuable acquisition to the Dragon forces.

NEW TRADE PUBLICATIONS.

Tobin bronze, manufactured by the Ansonia Brass and Copper Company, with offices at 99 John street, New York, is very fully dealt with in a booklet issued by that firm.

The product of the Empire Tire Company, of Trenton, N. J., comprising automobile tires, repair outfits, protectors, rubber matting, etc., is listed in a booklet just sent forth.

Automobile tops, wind shields, aprons, rugs, hampers, etc., and a full line of clothing for automobilists of both sexes forms the subject matter of the Detroit Motor Car Company's latest catalogue. The address of the firm is 1256 Jefferson avenue, Detroit, Mich.

A general catalogue of machinists' tools, etc., has been issued by the Billings & Spencer Company, Hartford, Conn. It is a duplicate of the firm's general catalogue of machinists' tools, but reduced to envelope size, with wood cuts introduced in place of half-tones.

Catalogue E, 1907, from the Boston Gear Works, Norfolk Downs, Mass., is a general gear catalogue, including chains, sprockets, bearings, steering devices, etc. It is of convenient pocket size and contains, in addition to the trade matter of the firm, a series of mechanical tables.

Mechanical features and material benefits of the Kilgore pneumatic shock eliminator, made by the Kilgore Manufacturing Company, Old Town, Me., are put forth in a booklet entitled "Ride on Air." It contains illustrations of the eliminator and diagrams of vibrations with and without this apparatus.

The Piper's percentage forms the theme of a booklet from the Diamond Rubber Company relative to tire cost during the Glidden Tour. The text shows the low figure paid to the piper by Diamond users during this strenuous competition, and illustrations depict a number of contestants equipped with the Akron firm's product.

The McNutt system of safety devices for handling gasoline, naphtha and other volatile liquids is dealt with in an illustrated booklet from the Non-Explosive Safety Naphtha Container Company, with offices at 1133 Broadway, New York City. The claims are that with these devices gasoline can be handled with absolute freedom in all circumstances.

Bulletin No. 7, received from the Dayton Electric Manufacturing Company, Dayton, O., describes the firm's 8-S switch-board gas-engine ignition outfit. It is for use with stationary gas engines

used to drive direct-current lighting or power dynamos. The switch board provides for charging two storage batteries alternately from the lighting or power dynamo.

How Rome spiral tubing radiators and condensers are manufactured, and how the different types look when finished can be learned by the booklet published by the Long-Turney Manufacturing Company, of Rome, N. Y. Numerous illustrations are given of these vertical tube radiators, as manufactured for well-known cars and for use on commercial vehicles.

Instead of issuing a general catalogue, the George Q. Hill Company, of Boston, Mass., has produced a booklet illustrating a few of their many examples of special metal parts made to order. The firm has made the commercial production of small metal parts in quantity a particular study, their processes including turning, swaging, rolling, drawing, blanking, forming and finishing of sheet metal, wire, tubing and castings.

As a possible aid to the designer, the Briscoe Manufacturing Company, of Newark, N. J., has produced a large hanger illustrating most of the distinctive radiator designs that have been used in this country and abroad during the last six years. Those made by the Briscoe Company are produced in half-tone, the others—mostly French, German and English—are shown in outline. The same matter is also printed in pamphlet form. Copies will be sent on request.

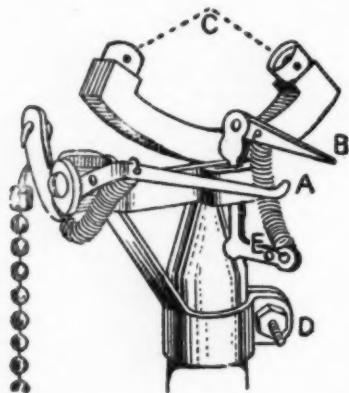
The Diamond Chain and Manufacturing Company has issued an instructive treatise on power chains and sprockets. In addition to listing the firm's complete line of automobile, bicycle and motorcycle chains, it gives information on the manufacture and use of machined chains. A chapter on power transmission explains the advantage of chain gearing. There is a table of sprocket dimensions and practical hints on how to get the best service from chains. A copy of the booklet can be obtained from the Diamond Chain and Manufacturing Company, at Indianapolis, Ind.

The instruction book for the guidance of operators of 1907 Peerless cars deals with its subject in a most commendable manner. Each part of the machine is described briefly, but clearly, and valuable information given on the manner of caring for and operating the car. By means of half-tone illustrations and carefully prepared line drawings it is possible to follow clearly the instruction given and arrive at a thorough understanding of the machine. Operators of Peerless machines will find it a useful book to consult. It can be obtained from the Peerless Motor Car Company, Cleveland, O., or from their selling agents.

There is interesting reading in the publication issued under the title "The Truth About the Automobile." The Cadillac Motor Car Company, of Detroit, Mich., has endeavored to obtain accurate data on three important points: The life of an automobile, the number of miles it will run on a gallon of gasoline, and the length of time the tires will wear. One hundred and fifty-eight records on these points, sworn before notaries and witnesses, have been obtained and are now produced. In addition, a tabular record is given of cost of repairs, mileage, gasoline consumption and number of passengers carried of 164 single-cylinder Cadillacs.

INFORMATION FOR AUTO USERS.

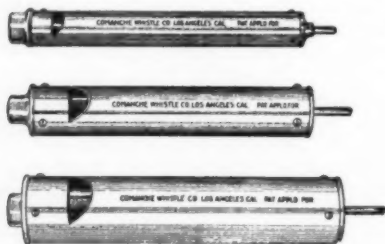
Electric Gas Lighters.—For lighting automobile headlights or other acetylene or coal gas lights, the Adjustable Burner Company, 18 Pearl street, Newton, Mass., is placing on the market a simple



ADJUSTABLE ELECTRIC GAS LIGHTER.

electric gas lighter which can be readily applied to any burner. It is operated by dry cells or other battery current and a plain spark coil, which can be installed by any autoist, as no particular knowledge of wiring is required. The lighter is practically indestructible, as all springs and working parts are out of the way of the flame when the burner is lighted. The lighters alone list at 50 cents each and their construction may be seen from the accompanying illustration.

Comanche Automobile Whistles.—The Comanche Whistle Company, 335 South Spring street, Los Angeles, Cal., is putting on the market a line of automobile, mo-

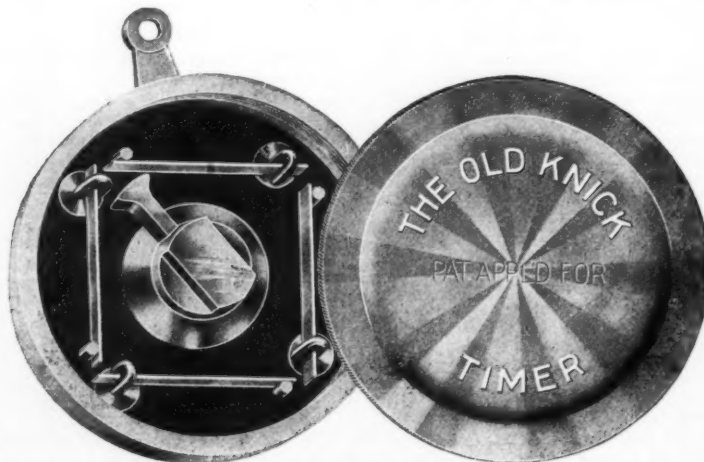


THREE SIZES OF COMANCHE WHISTLES.

torcycle and motorboat whistles of attractive appearance and simple mechanism that have met with considerable favor on the Coast right from their first appearance, and are now being introduced in other parts of the country. The Comanche whistle is blown by the exhaust from the motor and is operated by a neat bronze pedal, the note being produced by changing the position of the plunger in the barrel of the whistle.

When fully open a very low note is produced, rising on the scale until the blast is shut off entirely and having a range of about an octave and a half. No cut-out is required, a spring shutting off the exhaust when the pedal is released. The whistles are constructed throughout of polished brass and are made in three sizes, the small and medium types for cars having a free exhaust, and the large one for cars on which the exhaust is under more or less pressure. For motor boats they are correspondingly simple, no storage tank or pump being necessary, while the blast produced is audible for two or three miles. In addition to forming a very necessary part of either a boat or car as a signal, simple airs may be played with a little practice.

The Old Knick Timers.—These timers, made by the Pioneer Brass Works, Indianapolis, Ind., are constructed with an aluminum case, 3 1-2 inches in diameter, insulated with a 3-16-inch sheet of fiber back of the contact spring and by means of a sheet of mica between the fiber and case. The timing head is of phosphor bronze, while the spring is of the best oil-tempered steel, held in place by phosphor-bronze binding posts. It is further insulated through the case by means of a large fiber washer held in place with both lock and terminal nuts on the binding posts. These timers are made for any type of engine and for any number of cylinders, and are the result of a number of years' experience in the building of gas engine accessories. It is a matter of common knowledge that half the petty troubles arising from the ignition system may be traced to poor contact at the timer, so that it is always worth while to buy the best that is to be had where such an important essential is in question.



OLD KNICK TIMER WITH COVER REMOVED, SHOWING MECHANISM.

Extra Tonneau Seats.—The Graves & Congdon Body and Seat Company, Oak street, Amesbury, Mass., who manufacture a line of automobile bodies, are now placing on the market a detachable tonneau seat which is an improvement over many of the types hitherto in use, in that it cannot only be easily folded up or removed from place when not in use, but it leaves no unsightly attachments after removal. It is a revolving seat, and the bracket by which it is at-



G. & C. REVOLVING CHAIR SEAT.

tached to the side of the tonneau is of dovetailed construction. Two sizes are furnished, either in the white or finished. The accompanying illustration pictures the seat both ready for use and in the folded position. They are not only attractive in appearance, but are well upholstered and very comfortable.

Skiddoo Soap.—Most any soap takes off the surface dirt and that is all, say the makers of Skiddoo soap, the Brown Soap Company, Columbus, O., but Skiddoo soap takes off all the dirt and the stain as well. It is put up in tins in a convenient paste form and may be easily used as desired without any danger of harming the skin. Aside from toilet uses, for which it is absolutely guaranteed by the makers to remove "all the dirt," it is also useful for cleaning and polishing the lamps or other brass parts of the machine.

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